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50TH ANNIVERSARY

JOURNAL OF *Home Economics*

AMERICAN HOME ECONOMICS · ESTABLISHED 1909

RESEARCH ISSUE

PUBLISHED BY AMERICAN HOME ECONOMICS ASSOCIATION · WASHINGTON, D.C.

We hope she'll come knocking . . .

THERE'S A GIRL we would very much like to meet . . . a girl with a flair for food. We'd know her anywhere. There's something about her friendly, alert manner that attracts attention.

We notice she's interested in people as well as food . . . she loves to talk about homemakers . . . loves to discover their needs and tastes . . . she enjoys working with foods and thinking up ideas that will help *them* enjoy cooking and eating, too.

Of course she has been trained as a home economist

But we discover that her fascination with foods goes beyond her professional training. All her life she has liked to spend time in the kitchen.

All her life she has sifted and measured and chopped and rolled—getting the biggest thrill out of the different, exciting things you can do with food.

Maybe we find she has taken a course in art or in writing

Certainly she has a natural talent for presenting food with an artistic touch and with enthusiasm.

Do you know her?

If so, encourage her, and others like her, to knock at our door. For this is the kind of girl we like to employ in General Foods Kitchens.

We believe she'll feel at home with us for she'll be working with women of *her* type in a job that most girls with a flair for food truly *love*.

Just write to Field Home Economist, at General Foods Kitchens, White Plains, New York.

General Foods Kitchens

are sure you'll enjoy all their fine products, including

MAXWELL HOUSE COFFEE • JELL-O DESSERTS • BAKER'S CHOCOLATE & COCOA

GENERAL FOODS KITCHENS

are you interested in a moderate low-fat well-balanced breakfast?

When a moderate reduction of fat in the diet is indicated, a basic cereal and milk breakfast shown in the table below is worth consideration. Not only is the *fat content moderate* (*10.9 gm.—20 per cent of total calories*), but this convenient, economical breakfast is *well balanced* as demonstrated by the chart below showing its nutritional contribution to the recommended dietary allowances[1] for "Women, 25 Years." This basic cereal and milk breakfast is well balanced and nutritionally efficient as demonstrated by the Iowa Breakfast Studies.

recommended dietary allowances and the nutritional contribution of a moderate low-fat breakfast*

Menu: Orange Juice—4 oz.;
Cereal, dry weight—1 oz.;
Whole Milk—4 oz.; Sugar—1 teaspoon;
Toast (white, enriched)—2 slices;
Butter—5 gm. (about 1 teaspoon);
Nonfat Milk—8 oz.

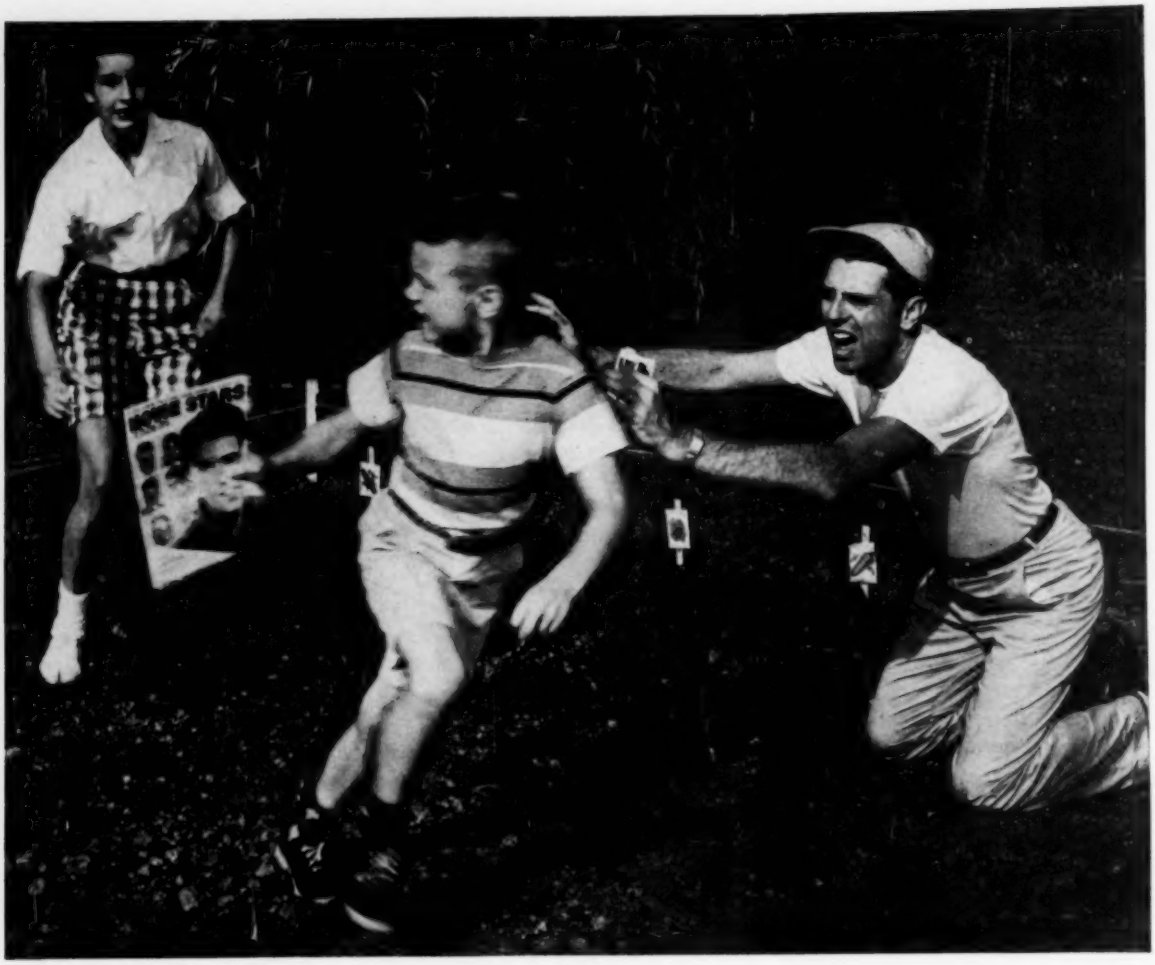
Nutrients	Calories	Protein	Calcium	Iron	Vitamin A	Thiamine	Riboflavin	Niacin	Ascorbic Acid
Totals supplied by Basic Breakfast**	503	20.9 gm.	0.532 gm.	2.7 mg.	588 I.U.	0.46 mg.	0.80 mg.	3 mg.	65.5 mg.
Recommended Dietary[1] Allowances—Women, 25 Years (58 kg.—128 lb.)	2300	58 gm.	0.8 gm.	12 mg.	5000 I.U.	1.2 mg.	1.5 mg.	17 mg.	70 mg.
Percentage Contributed by Basic Breakfast	21.9%	36.0%	66.5%	22.5%	11.8%	38.3%	53.3%	17.6%	93.6%

*Revised 1958. Food and Nutrition Board, National Research Council, Washington, D.C.

**Cereal Institute, Inc.: Breakfast Source Book. Chicago: Cereal Institute, Inc., 1958.
Watt, B. K., and Merrill, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.

[1]The allowance levels are intended to cover individual variations among most normal persons as they live in the United States under usual environmental stresses. Calorie allowances apply to individuals usually engaged in moderate physical activity. For office workers or others in sedentary occupations they are excessive. Adjustments must be made for variations in body size, age, physical activity, and environmental temperature.

CEREAL INSTITUTE, INC.
135 South La Salle Street, Chicago 3
A research and educational endeavor devoted to the betterment of national nutrition



ACTIVITY

Our daily activities demand energy from food . . . as does maintenance of healthy bodies . . . repair of sick ones . . . and growth of young ones. The amount of energy demanded varies from level of activity . . . body size . . . stage of growth . . . pregnancy . . . lactation . . . and state of health.

Food intake is largely controlled by our body's demand for energy. Wise selection of food is necessary to insure that we satisfy nutrient needs while we satisfy energy demands.

Foods combined in the minimum amounts suggested in *A Guide to Good Eating* provide most of the nutrient needs and about 2/3 the energy needs of the average healthy active adult. Of the adult Recommended Dietary Allowance, these amounts of *milk and dairy foods supply about* 1/7 *of the calories . . . foods in the meat group supply about* 1/5 *of the calories . . . vegetables and fruits supply about* 1/9 *of the calories . . . breads and cereals supply about* 1/8 *of the calories.*

More of these or other foods . . . with moderate use of sugars and syrups, fats and oils in food preparation and at the table . . . quickly increase the calorie intake to meet energy needs. An adequate supply of energy is essential if the body is to make efficient use of dietary protein. Thus, even in reducing diets, calories from carbohydrates and fats should be included.

When combined in well-prepared meals, foods selected from each of these four food groups can satisfy the tastes, appetites and energy needs of all members of the family . . . young and old.

USE DAILY
A GUIDE TO GOOD EATING

DAIRY FOODS
3 to 4 glasses milk—children
4 or more glasses—teenagers
2 or more glasses—adults
Cheese, ice cream and other milk-made foods can supply part of the milk

MEAT GROUP
2 or more servings
Meats, fish, poultry, eggs, or cheeses—with dry beans, peas, nuts as alternates

VEGETABLES AND FRUITS
4 or more servings
Include dark green or yellow vegetables, citrus fruit or tomatoes

BREADS AND CEREALS
4 or more servings
Enriched or whole-grain
Added milk improves nutritional values

The nutritional statements made in this advertisement have been reviewed by the Council on Foods and Nutrition of the American Medical Association and found consistent with current authoritative medical opinion.

Since 1915 . . . promoting better health through nutrition research and education

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Notice of change in address should be received six weeks before the date of issue on which the change is to take effect. Both the *old address* and the *new address* should be given.

FLASHES FROM OUR ADVERTISERS AND EXHIBITORS

As a service to those interested in this subject, the Cereal Institute has prepared a leaflet **Are You Interested in a Low-fat Well-Balanced Breakfast?** The Institute has informed us that the subject matter is based on scientific library research and was reviewed by leading authorities for publication. Write Cereal Institute, Inc., 135 South LaSalle Street, Chicago 3, Illinois, for free copies.

To accommodate teachers using the spring term to work out their classroom projects involving the use of unflavored gelatine, the Charles B. Knox Company has **advanced the closing date** for mailing of entries in their International Chefs' Tour Contest to April 8. March 2 was the deadline previously announced. The action is prompted by the many requests from interested teachers.

A compact, budget-priced, built-in cooking top designed for 24-inch-wide cabinets is an addition to **Frigidaire's** broad line of built-in products. The cooking top features four fast-heating, sealed electric units and quick, "snap-in" type installation. Also of interest is the new space-saving design of the cooking top which has been reduced in depth to provide space for the installation of a drawer in the cabinet below.

A remote control feature on the **Hoover Constellation** canister-type cleaner is "a real step-saver and added convenience for the housewife," according to the Hoover Company. The control switch is right "under the thumb" of the operator and eliminates walking back and forth to the cleaner to start and stop it. When the hose is inserted in the regular cleaning outlet, the control is always at the end of the hose. A switch is also provided on the cleaner for operating it without the hose or when the hose is connected to the blower outlet at the bottom of the cleaner.

When you begin talking about prunes, do you find that almost everyone has her pet recipe? That was the experience of the home economists who were preparing a publication on the subject, so they sought the favorites of other home economists and of many of the country's leading manufacturers of food products. Their results are compiled in a booklet **Full O' Prunes** published by the California Prune Advisory Board. In addition to recipes, the booklet contains brief serving suggestions, a bit of background on the industry, some nutrition notes, and directions on ways to plump and cook prunes. Single copies are free to teachers and food leaders. Write: California Prune Advisory Board, c/o Flanley and Woodward, Inc., 30 East 40th Street, New York 16, New York.

New styling and new performance features, including an exclusive, recently developed top burner, high light the 1959 **Roper gas ranges,** company officials report. The new Roper *Circle-Simmer* top burner combines excellent performance, economical operation, and great cleaning ease, Roper says. An improved version of Roper's *Rotis-O-Grill,* range-top rotisserie-broiler-griddle, is offered this year on several models including one 30-inch range.

When the ancient Greeks discovered how to rotate an object by pressing down the handle, they little dreamed this same principle would some day be applied to the job of egg beating. That's what Ekco Products Company has done—used this ancient idea to produce a **one-hand egg beater.** Handy and easy to operate, this small sized beater can whip an egg within a cup or glass in a matter of moments. And since you need only one hand to operate it, your other hand is free to steady the container. In addition, it eliminates the need for big bowls in all little mixing jobs.

There seems to have been a flurry of appointments and promotions among home economists in the business field recently. News has reached us of the appointment of **Mamie Hardy** as home economist with the National Cotton Council. She will work with both high school and college home economics teachers and with Extension Service home economists. **Sara A. Hall** is now staff home economist in charge of institution services at Kellogg Company. **Ethel Smetts** has joined Vogue Pattern Service as an educational representative. **Virginia Van Nostrand** has been advanced to the position of Director of Home Service for the Whirlpool Corporation and will be succeeded in her former position as assistant home service director by **Mary Meighan,** former regional home service director in the Chicago area. In her new position Miss Van Nostrand will be responsible for the development of consumer use information on all RCA Whirlpool gas and electric home appliances, coordination of the work of the company's field staff of home economists, and the preparation of product instruction booklets. **Helen Kirtland,** whose photograph appears below, has moved to the General Electric Company's Appliance and Television Receiver Division as manager of its Consumers Institute. She will direct the activities of staff members in their work with distributor home economists, utility and school home economics experts, and national home economics organizations. The Institute also helps maintain press liaison regarding the entire homemaking task, and staff members feed back to the Division's departments product use reports from consumers, retailers, and distributors. Miss Kirtland's headquarters will be at Appliance Park, Louisville, in the Institute's new facilities.

BEATS A PIZZA!

Ry-Pizza is easier fun for parties

Ry-Pizza! It's a new crowd-pleasin' party refreshment that young hostesses can make right at home. Unlike ordinary pizza, this exclusive recipe is a cinch to make because the pizza paste goes right on top of munchable, crunchable Ry-Krisp crackers. Saves lots of fixing and mixing.

It's a cinch to please, too. The distinctive whole-grain rye flavor of Ry-Krisp gives Ry-Pizza a delightful, different flavor all its own. And you can't find a pizza that's kinder to waistlines; only 20 calories in a whole Ry-Krisp cracker. The recipe for Ry-Pizza is included in Ralston's new free booklet "Party Recipes from Checkerboard Square." Send for your copy right away.

RALSTON PURINA COMPANY, *Checkerboard Square, St. Louis 2, Missouri*

but PET *Instant's* inside job does even more for *you!*

Instantized so it dissolves almost at the touch of water.

As far back as Cleopatra, women knew there was beauty magic in milk, and the more extravagant actually bathed in it. Today's charmers are wiser . . . they know it's much more effective to do their beauty building from the inside. For instance, drinking PET *Instant* Nonfat Milk daily helps give you all these beauty benefits:

A lovelier complexion—Calcium and B-vitamins help give you a soft, beautiful skin and aid digestion, an important factor in keeping your complexion clear and radiant.

Prettier teeth—Milk minerals build healthy bones and teeth, lessen likelihood of cavities.

Healthier hair and nails—Protein rebuilds and revitalizes body tissues, helps you to healthy, shining hair and strong nails.

A better figure—Fat-free PET *Instant* actually cuts your milk calories in half, yet gives you the vital nourishment you need for a trim, well-formed body.

More sparkle and vitality—Plenty of protein provides energy and pep, and B-vitamins even give your morale a boost. No wonder PET *Instant* is America's sparkle-and-vitality drink!

Watch PET *Instant's* beauty magic work for you!

"PET"—Reg. U. S. Pat. Off. Copr., 1959, Pet Milk Co.

#2 of a series on the
EDUCATION OF WOMEN
by Bernice Fitz-Gibbon

Miss Fitz-Gibbon, who was graduated from the University of Wisconsin, where you couldn't get your sheepskin until you could spell and swim around the tank twice. Fitz is glad that she can spell and swim around the tank twice, and sorry that she can't sew. She says, "I'm no professional. I sew strictly for my own amazement."

Confucius say, "One girl sewing worth eighty-seven thousand dollars!"

PHOTOGRAPH COURTESY OF TAYLOR & DULL

I didn't pick that $87,000 figure out of the air. That was the price that Renoir's lovely painting, "Girl Sewing," brought at the Kirkeby sale at Parke-Bernet in New York City last November 19. A real live "girl sewing" is worth more than $87,000 to her husband—especially when you add up clothes for herself and her children, slipcovers, draperies, curtains, bedspreads, embroideries, etc. But the money angle is of less importance in the creating of a happy beautiful home than is the contribution that sewing makes to *culture* and *creativity*. Russell Lynes says that America is on a culture bender. Vannevar Bush recently proposed a new model for our society and called it "the gentleman of culture." Mr. Bush points out that property and leisure, formerly upper-crusty, are possessed by most Americans today.

If I were running a College of Home Ec, I'd work out a cultural smorgasbord of a curriculum that would tie into this new awareness of beauty. And I'd do it not only with courses in color and design, but with actual *hand skill* courses in sewing —clothing construction and home furnishings construction. These courses would separate the chic from the gauche, and bring the cream of the campus pounding on Home Ec doors. Because every female knows that the ability to create a home that is a wellspring of culture is more important than writing a thesis on "Is a perborate milder than a hypochlorite in bleaching?" Science is useful, but home is where the *art* is. And even embroidering is again Art—ever since the exquisite embroideries of Mariska Karasz were the sensation of New York's Museum of Contemporary Crafts. With the Renaissance of the Distaff Arts, maybe the embroidery hoop will replace the hula hoop.

Bernice Fitz-Gibbon

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O.N.T. Thread, C. & C. Zippers, Milwards Needles, Boiltex® Narrow Fabrics, Red Heart® Yarns, Crochet Cottons, Bondex® Hot-Iron Tapes

Betty Crocker

makes news again . . .

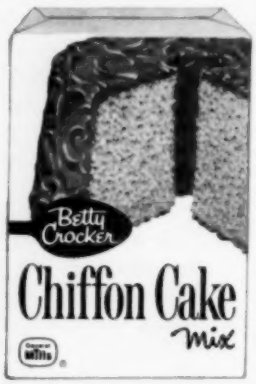
Now, her famous

Chiffon Cake

recipe joins the family of

Betty Crocker Mixes!

10 years ago Chiffon Cake Recipe made history . . . Some Home Economics teachers may remember when Betty Crocker's Chiffon Cake Mix was created. The first really new cake idea in 100 years, combining the feather-lightness of angel food cake with the velvety richness of a butter-type cake.



(*Available in Cocoa and Orange flavors.*)

The cake with the "mystery ingredient" had a story full of human interest. A retired Los Angeles man, Harry Baker, offered a secret recipe to Betty Crocker because he felt she had done so much for the women of America. The "secret ingredient", as everyone now knows, was liquid shortening—vegetable oil. Chiffon Cake was an immediate success!

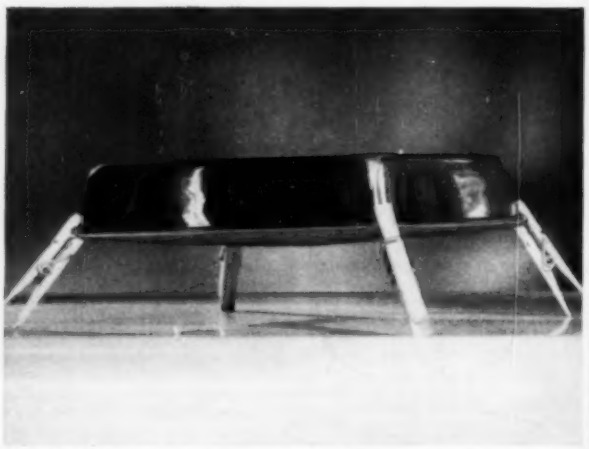
The idea of a Chiffon Cake Mix came to the minds of homemakers after the success of Betty Crocker's Angel Food Cake Mix. Why not adapt featherlight, sky-high chiffon cake, with its layer-cake richness, into a mix? Many women wrote to Betty Crocker suggesting this. And Betty Crocker's kitchens, alert as always to the wishes of America's homemakers, began experiments to solve the problems involved.

Now we have perfected our success-tested Chiffon Cake Mix! And because the Home Economists of America are always interested in the newest methods of homemaking, where quality is not sacrificed to speed, we think you will be happy to hear about a Chiffon Cake Mix backed by the sterling reputation of Betty Crocker of General Mills.

General Mills

1. *Betty Crocker's Chiffon Cake* was a huge success when introduced ten years ago. Everyone loved its glamorous fluffy lightness, moist richness. Eventually women asked for a chiffon cake *mix*.

4. *Unitized Package* consists of two separate cartons inside an attractive overwrap. Smaller carton contains egg whites, in heavy moisture-proof foil; larger one has batter mix in a thick, grease-proof envelope. A convenient package with quality features you expect from General Mills.



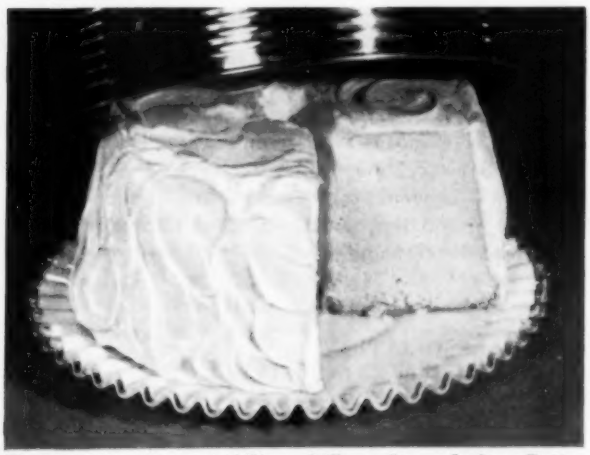
7. *Make it in other pans, too!* This chiffon cake does not *have* to be baked in a high tube pan. Bake in 13 x 9½ x 2″ oblong for 45 to 55 minutes; two 9 x 9 x 2″ pans for 35 to 45 minutes; or two loaf pans, 9 x 5 x 3″ for 45 to 55 minutes. Invert, cool on clothespins.

2. *Liquid Shortening* being the 'secret' of chiffon cake's luscious lightness, General Mills had to solve the problem of how to blend this with dry ingredients, in mix form. They finally devised a superfine *spray* method.

3. *Months of testing followed,* as always, when we launch a new product. It was tested, perfected by General Mills Home Economists in Betty Crocker Kitchens. Then hundreds of women, all over the country, tested it in their homes and recorded their experiences.

5. *Using your chiffon cake mix: Step 1.* Mix 1¼ cups water with contents of egg white carton. Blend on low speed 2 minutes. Beat until STIFF with electric mixer, rotary beater or wire whip. It is essential that the mixture *holds stiff, sharp peaks.*

6. *Steps 2 and 3:* Mix the contents of the batter carton with water and 2 fresh eggs. Then pour this batter over the stiffly beaten egg whites and fold until thoroughly blended. Pour mixture into an ungreased 10 x 4" tube pan and bake at 350° for 45 to 55 minutes.



8. *This cake stays moist!* Your chiffon cake made from Betty Crocker Mix has outstanding keeping qualities. Store it in a cake container or under an inverted bowl, and your cake will remain moist for days.

9. *Backed by General Mills' guarantee:* As Betty Crocker says: "I guarantee a perfect cake every time you bake . . . cake . . . after cake . . . after cake!" If not, your money will be refunded. That's the beauty of dealing with General Mills, a great company with *your* welfare at heart.

Washington News

• **The First Session** of the 86th Congress opened on January 7, with a flood of new bills introduced within the first few days. Of the 2,000 bills introduced into the House of Representatives in the first three days, 85 affect education. As summarized by the Newsletter of the Educational Press Association on January 20, the new bills in the educational field cover scholarships, tax law changes to help education, veterans and their education, federal support for teachers' salaries and school construction, improvement of international educational exchanges, help for the education of exceptional children, science education, promotion of the fine arts, and training for nurses.

• **School lunch bills** were introduced in both Senate and House of Representatives. The Senate bill (S489) is designed to facilitate distribution of surplus food products for school lunches and to needy families. House bills (HR347) would increase the minimum protein requirement for lunches provided under the National School Lunch Act; HR762 would permit junior colleges to participate in the Act; HR2150 would put the school milk program on a permanent basis; and HR1938 would provide a permanent extension of the special school milk program.

• **Implementation** of the National Defense Education Act, passed in the closing days of the last Congress, is being carried forward with allocation of funds and approval of projects.

A report at the end of January showed that plans have been approved and funds allocated for

–the creation of Guidance, Counselling and Testing Programs in three states (Title V—Part A).

–The establishment of Guidance and Counselling Institutes has been authorized at eight colleges and universities to help the Nation's students recognize and make the best use of their talents and potentialities. As many as 40 such Institutes may be authorized before the end of the current fiscal year (Title V–Part B).

–Six pilot programs have been authorized for the collection and evaluation of basic information on current use of new media for educational purposes (Title VII).

Reni photos

President Eisenhower awards the gold medal for Distinguished Federal Civilian Service to Hazel K. Stiebeling at the White House on January 20, 1959. Secretary of Agriculture Ezra Taft Benson (left) looks on as the President congratulates Dr. Stiebeling, who is director of the USDA's Institute of Home Economics. She was honored because of her lasting contributions to the science of human nutrition. Studies made by her and under her direction have led to notable improvement in nutrition of the American people. Dr. Stiebeling has also been a leader in many international conferences on nutrition so that the results of her work are helping to improve the lives of people throughout the world.

Federal funds totaling $6 million have been allocated by U.S. Commissioner of Education Lawrence G. Derthick to 1,227 colleges and universities in all 49 states, the District of Columbia, Hawaii, and Puerto Rico for the establishment of National Defense Student Loan programs.

Since each educational institution administering a student loan fund is obligated to contribute to the fund at least $1 for every $9 of federal money, federal expenditures of $6 million for this fiscal year will establish a total fund of at least $6,667,000. This would provide 6,667 loans under the initial appropriation if every student received the maximum $1,000 loan.

AMERICAN HOME ECONOMICS ASSOCIATION
Fiftieth Annual Meeting, Milwaukee, Wisconsin, June 23 to 26, 1959
Headquarters: Municipal Auditorium

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JOURNAL OF Home Economics

The role of home economics in the small liberal arts colleges and the development of programs of education for family living for the students are two phases of the timely topic discussed in this article. It includes some workable recommendations for this group of colleges.

Programs of Education for Family Living for the Small Liberal Arts Colleges

Sister Mary Veronica McAndrews, C.H.M.

Sister Mary Veronica is a member of the faculty of the department of home economics at Marycrest College, Davenport, Iowa. This article is based on the dissertation for her doctor's degree awarded at Ohio State University in 1958.

IN recent years, there has been a growing concern for the home economics program offered in the small liberal arts college. Some educators have felt that, in their effort to follow the program of the large institutions, these smaller colleges are failing to recognize the particular contribution which they might make more effectively in preparing both majors and nonmajors for family living.

Because many of the faculty of the smaller colleges were educated in the large universities, it is understandable that they should model their programs after those of the schools they know best. But is this in keeping with the goals and purposes of the small undergraduate college, especially if the small college is a liberal arts college?

Many educators agree that education for family living is a legitimate function of the liberal arts college, but they differ as to how this may best be achieved. Some believe that if a person is educated in the liberal arts, he has the best possible education for living, whether it be personal, professional, or family living. Others accept education for family living as a major goal and yet have become so engrossed with professional or special education that the interests of both liberal education and family life education have been neglected. Between these two extremes are those who appreciate the importance of liberal education but who are also concerned about a sound program of education for family living. They see the need and are willing to venture forth. It is with this third group that we are presently concerned.

This study was designed to test, first, the hypothesis that a survey of forward-looking programs would yield information helpful in determining the nature of a sound program of education for family living in the small liberal arts college. A second hypothesis was that an interdisciplinary program of education for family living has certain characteristics which make it especially appropriate to the small college.

Information was sought about a variety of promising programs of education for family living to answer the following questions:

1. What are the strengths and distinctive characteristics of such programs? What makes a program strong or distinctive in a given situation?
2. How were these programs developed? Is there anything in this development that gives a clue as to why the program is effective?
3. What problems is one likely to encounter in developing such a program?

Procedure

Approximately one hundred leaders in education for family living were asked to suggest forward-looking programs for consideration. To facilitate this, a check list was formulated describing forward-looking programs in terms of a variety of possible characteristics. Some of the characteristics were opposing statements, but this procedure was in keeping with the study and the belief that no one pattern is best. Furthermore, a study of these features might reveal future trends. Space was provided to write in characteristics not listed. Re-

spondents were also asked to suggest names of others who might know promising programs.

An effort was made to include various groups which have been concerned with education for family living at the college level.

Edna P. Amidon, director of the Home Economics Education Branch of the U. S. Office of Education, was asked if she and the regional supervisors would meet in a round-table discussion to suggest programs. Each of the state supervisors of home economics was asked to recommend colleges which she believed merited study. Heads of several large foundations concerned with family life and the National Council on Family Relations were also approached. As a precautionary measure to be sure that all programs had been considered, a careful study was made of the bulletins of accredited colleges.

The most comprehensive reports of college programs were received from Miss Amidon and the regional supervisors who had conferred as a group to suggest programs. It was interesting to note, as questionnaires were returned, the number of times the same institution was recommended.

A questionnaire was then sent to the administrators of the recommended colleges. Information was sought concerning the location of the program in the college, the length of time the program had been in existence, the organization of the program, and features considered distinctive by the staff. Administrators were asked to send brochures or descriptive materials and to cite published studies which might be helpful in analyzing the program.

Questionnaire returns from the recommended colleges were analyzed in terms of these criteria:

1. The institution agrees that it has a program of education for family living.
2. It is a program comprising a definitely planned area or sequence.
3. The program has a family-centered emphasis.
4. The program has uniqueness in that it has distinctive characteristics which show concern for education in family living.

This last criterion was considered most significant since one of the primary aims of the study was to locate programs which were distinctive. If a college met the first three criteria, the selection for more detailed study was to be determined by the uniqueness of the program as indicated by its distinctive characteristics.

Five programs were selected for visitation. It would have been desirable to visit more than five, but the wide geographic area in which these institutions were located required so much in the way of time and travel that this was not possible. To supplement, therefore, and to give a more complete picture of the various types of programs educating for family living, an open-end questionnaire was sent to 15 other colleges whose programs ranked high in distinctive characteristics.

Analysis of Preliminary Questionnaires

Of the 96 colleges recommended for study and to which questionnaires were sent, 86 replied. Fifty-five colleges reported a definite sequence, 11 of which were interdisciplinary programs (see table 1). Eight institutions indicated one or more courses rather than a planned program; another described a noncredit program believed to be effective.

Among the remaining institutions, several respondents stated that although they felt they were offering a "respectable" program of education for family living, they believed it was quite traditional and in no way forward-looking. Several others completed the questionnaire in terms of a professional major in child development and/or family living.

The location of the programs concerned with family living within the 64 institutions varied. This was expected since the programs recommended for study represented a variety of departments and a wide range of experiences (see table 1). Two of the programs were in social science departments. One combined courses from sociology, economics, and anthropology. The largest number were in home economics departments.

Six programs which were once listed as home economics now bear names which indicate a broader approach than is usually found in the traditional home economics department today, namely: College of Family Living, Home and Community Service, Family and Community Service, Family and Community Living, and Home Economics and Family Living.

TABLE 1

Location and kinds of programs

PROGRAMS	NUMBER
Program in one department	
Home economics	42
Sociology	2
Interdisciplinary programs	
With home economics	8
Without home economics	3
One or more related courses	
Home economics only	2
No home economics courses	6
Noncredit program	1
TOTAL	64

Of the 55 colleges which had a definitely planned sequence or program, 44 indicated the length of

time the program had been functioning (see table 2). Eleven had been organized in their present form for 5 years or less while 11 others had been so organized from 6 to 10 years. Eight reported they have been functioning with their present emphasis and organizational structure from 11 to 15 years, and 14 for 16 years or longer.

Among the 55 colleges, 48 offered a major program. Two offered only a minor area, and 3 were entirely elective with neither a major nor a minor area. One program was a part of the required general studies area.

Seventy-three per cent of the programs established within the last six years reported a core program. Further study of the data shows that a core reflected the recency of the program. There were twice as many core programs in departments organized within the last 15 years as in those organized more than 15 years ago.

All the colleges having a definite program or sequence stated that their basic or core courses (where there was a core) were open to all students on the campus. Several institutions qualified this, however, by explaining that students might take any courses in the program if they met the prerequisites. Since prerequisites were listed for some core courses and since it is the prerequisites that often keep students from electing courses of interest to them, this is almost the equivalent of not having such courses open to the entire student body. One department stated that core courses were theoretically open to nonmajors. In reality, however, these classes were filled with majors.

Slightly more than half of the programs established within the last 6 years were reported as having a family-centered emphasis. Sixty-four per cent of those established 16 years or longer gave a family-centered emphasis as a distinctive characteristic of the program.

By far the largest number of distinctive features were related to curriculum. Fifteen administrators reported a marked emphasis on intellectual concepts and principles. As would logically follow, then, less attention was given to skills and technical proficiency in almost as many programs. Respondents in 10 institutions stated that requirements for the major area or for the core and occasionally for both had been reduced so that students might obtain a broader liberal or general education. In other cases, the college had not increased the requirements, but the value of liberal and general education was being stressed, and the department through its advisory program was strongly recommending a broad basic education.

Several departments listed continuous or periodic evaluation of the program as a strength, and two cited a program of ongoing research and experimentation in program development. Service courses to nonmajors were considered important in a number of colleges.

Strong faculty and administrative support were claimed by six administrators for their programs. Others reported that while responsibility for education for family living had been delegated to one department in the institution, education for family living in a broad sense was a major objective of the total college program. An emphasis on interdivisional and interdepartmental planning and cooperation characterized five programs.

It must be noted that an open-end question rather than a check list was used to obtain information concerning distinctive features. If a check list had been used, many more characteristics might have been called to mind. The pressure of time may have prevented many busy administrators from thinking through some of the distinctive characteristics of their programs. Some, too, may have taken for granted certain characteristics which others listed as distinctive.

An encouraging aspect of this study was the strong interest expressed by many to whom the questionnaires were sent or with whom the problem was discussed. Administrators generally indicated that they knew there was much more to be done; yet they saw obstacles to be overcome, and they often expressed some uncertainty as to how to proceed. Some explained that they were able to go only as far as the group and the present circumstances would permit. All indicated a great interest in recent developments on other campuses.

TABLE 2

Programs reporting a core or family-centered emphasis

NUMBER OF YEARS ESTABLISHED	NUMBER OF PROGRAMS	WITH CORE		WITH FAMILY-CENTERED EMPHASIS	
		number	*per cent*	*number*	*per cent*
Less than 6	11	8	73	6	55
6 to 10	11	6	55	4	36
11 to 15	8	4	50	3	38
16 or more	14	4	29	9	64
No indication	11	3	29	7	64

Findings

Most pioneering efforts have been fraught with difficulties and problems. Education for family living has been no exception. Current literature reflects a recognition of the need for it; yet the fact

that relatively few colleges have forged ahead with broad family living programs may reflect the difficulties involved. Major problems, as reported by staff members in the colleges and as observed in visits to the institutions, are concerned with (1) administration, (2) nature and content of the program, and (3) the development and implementation of the program.

Dynamic leadership and effective administration are requisites for a sound program of education for family living. Such administration generally characterized the programs in this study. In general, it was observed that efforts were made by administrators to provide guidance and to stimulate faculty to assume as much responsibility for the development of the program as possible.

Administrators have faced a number of problems in developing programs. One of the most serious has been in relation to the instructional staff. The broad courses which characterize such programs cannot be taught from the point of view of a specialist; yet a high degree of specialization characterizes much graduate education. Relatively few teachers have the breadth of education necessary for participation in effective education for family living. Moreover, with the increased emphasis on specialization, some faculty members feel it is beneath their dignity to teach general education courses. All too frequently the generalist lacks prestige in our colleges and universities. Salary and rank favor the specialist. Until this problem is solved, it will not be easy to attract gifted teachers into general education programs.

Another important problem is that some faculty have been highly theoretical in educating for family living. They seem to lack understanding of any family life pattern different from their own. Others lack insight, the warmth of personality, and the balanced maturity necessary for successful teaching in this area. One administrator commented on this as a real difficulty. He added that he had withdrawn sections rather than assign them to instructors who might do more harm than good to students. Those instructors had high academic qualifications, but they were themselves emotionally insecure and unstable.

The constant turnover of staff presents another hazard, however well organized the area may be. Unless careful provision is made for orientation of new staff, the program may revert to the original traditional curriculum. Two administrators cited this as their most serious problem once the program had been launched.

Class size and scheduling. As programs of education for family living have developed on some campuses, classes have tended to become larger. While the matter of class size is in the realm of controversy, some feel that, in areas such as family relations, classes should be kept small in order to provide opportunity for participation and active discussion and sharing of experiences. Several institutions reported they had closed classes, although they knew many more students were eager to register for them. They regretted this action, but considered it wise.

While it may seem a minor detail, scheduling of classes can be a contributing factor to the success or failure of a program, especially in the developmental years of a program. Certain hours are more popular with students. Classes scheduled very early or in late afternoon are not likely to attract students unless they are required courses. Pleasant surroundings and adequate facilities can also contribute much to the prestige of a program. With space at a premium, as it is in many institutions today, a new area such as family living may tend to be overlooked. While an attractive environment may not be essential to a program, it can add or detract much as was evident in the programs that were studied.

Staff members have faced a number of problems in determining the *nature and content of programs* educating for family living. How are they to determine the needs of students and how can these needs best be met? Since students come with varied backgrounds, at what level should courses be pitched to be sufficiently challenging and yet not be too difficult? Some faculty observed that in their opinion required core courses penalized gifted students and those with exceptional backgrounds.

The development of such basic or core courses likewise presents a difficulty. In planning such courses, material is sometimes selected from several courses in a sequence in order to give the rounded experience needed by students who will take no other work in that area. Several faculty members reported they believed this was an undesirable practice as far as the later advanced courses in the sequence were concerned. In the effort to include essential learnings, they felt they had, as it were, "skimmed the cream" from other courses, which then became less interesting. This raises several interesting questions. Must the content of advanced courses remain fixed? Does this reorganization of content create an opportunity to enrich later courses with new material, with recent research of value to more advanced students?

Almost without exception, faculty stated that the

organization of these new programs, whether it was a complete reorganization or a change of focus and emphasis, was time consuming. If changes in the basic course meant that the entire sequence had to be replanned, the problem was even more serious. Some felt that students did not profit from the core course to an extent commensurate with the time and energy expended by the faculty. Others, who saw the value of the new courses, agreed that it had been a struggle to find the necessary time for the task. Is it possible to lighten the duties of those who are involved in such program and course planning in order that they may do justice to the task without neglecting other duties and without being so pressured for time?

If there is a required core, how many hours should it include? Too large a requirement restricts the number of hours students may devote to other electives. Where does the point of diminishing returns begin? Faculties are divided in their opinions about this. Some favor a small core. They believe that students should be permitted to make a decision concerning the courses they will take. Others believe that too much is at stake to allow students to decide what is important to them and what is not.

Interdisciplinary programs. Real obstacles were frequently met in developing these forward-looking programs. Once the programs had been set in motion, consummate skill has been necessary to keep them functioning smoothly and effectively. Participating departments in some interdisciplinary programs have often remained rather isolated from one another; consequently, they have found it difficult to understand one another's goals. Some staff members have found it difficult to cross departmental lines in order to work out a unified and integrated program, however worth while it might seem. On the other hand, there are usually a few who guard jealously what they believe to be their own subject matter area; they claim full responsibility for it. Still others are so busy developing professional majors that they have no time for or interest in interdepartmental planning. How is it possible to interest staff in an interdisciplinary program? How do they learn to understand one another and to plan in terms of goals and objectives common to the group?

Good public relations can do much to further both the development and the functioning of education for family living. Staff who can interpret their program to the public both within and outside of the college can greatly augment the understanding and the support which the program receives. In addition to a notion held by some faculty and students that courses in family living are not academically respectable, there are also those who believe they are not appropriate for men. This may be a matter of nomenclature. One institution apparently solved this problem by listing the courses as general studies courses rather than as courses in family living. Another listed courses both in the department from which they came as well as in the area of education for family living.

Conclusions

Thus, a variety of findings support the first hypothesis—that information could be obtained about the nature of a sound program of education for family living.

1. The variety of programs having achieved a recognized degree of success indicates that *there are several ways of organizing programs of education for family living which are in harmony with the goals of the liberal arts college.*

2. *There are varied procedures possible in developing a program.* The individuality of the programs proved to be one of the most intriguing aspects of the study, but the ways in which they were developed proved no less interesting. No two administrators reported the same procedure.

3. *Staffing the program is of major importance to the success of the program.* Since these programs represented departures from the traditional, there was need for vision and pioneering effort. A sound program could be developed only by those who were creative and resourceful.

4. *Leadership, which is essential both in developing and maintaining an effective program of education for family living, may be provided in different ways.* While it was noted in each case that leaders had clearly defined goals, they also brought to their task a rich and varied background of experiences. They had achieved status in their profession and were not afraid to do something new and different. Tradition has its values, but there are those who forget that traditions may also be created. Tradition should imply progress.

5. *In-service education is essential to the continued success of the program.* "To keep the light burning—that has been our most serious problem once the program was developed," reported one administrator.

6. *There may be a few who do not wholeheartedly accept the program.* While the presence of such faculty may have slowed down the progress of the programs to some extent, they also represented a challenge.

7. *A program of education for family living may be enriched and made more complete by including education for community living.*

Other findings supporting the second hypothesis—that there are certain characteristics which make the interdisciplinary program particularly suitable for the small college—are as follows:

1. *An interdisciplinary approach to education for family living will tend to emphasize intellectual concepts rather than specialization or technical proficiency.* Administrators in these programs reported that by drawing staff from the several departments, they had achieved a broad approach to education for family living and had de-emphasized the more specialized program. The structural design of the interdisciplinary program serves to draw students from widely divergent areas into the family living courses. This diversity of interest and background made a liberal approach even more necessary and, to a certain extent, more possible.

2. *Interdisciplinary programs reflected a breadth not found in other programs.* Faculty members participating in these programs reported that through discussion and planning with members of other departments, they had broadened their own interests. They developed insights into other areas which in turn strengthened their own work. The very fact that this more general approach with its more challenging content drew more and better students into the classes added to the interest of the courses for both students and instructors.

3. *An interdisciplinary program can eliminate the proliferation of courses to which accrediting agencies have so frequently objected in recent years; according to staff members and students, it has also resulted in better courses.* Faculty members in these smaller colleges are usually less specialized than those in the larger universities so that they may readily cross departmental lines in planning and developing courses to meet the needs of several areas. While such course planning may seem to be done at times in the interest of expediency, it usually results in a course more suited to the liberal arts college than the previous narrowly specialized courses.

4. *An interdisciplinary program has status in the eyes of students and staff members.* In some institutions, family living courses contributed by the various departments to the program were each listed in two departments, the department which contributed the course and the family living area. Students who were sensitive to being enrolled in courses designated as family living could then enroll in the more traditional department. This plan also permitted students to take courses in family living while completing a major in some of the more traditional related areas. In other institutions, family living courses have been listed as general studies or general education courses. It is realized that these are mechanical devices, but until education for family living has more status than it has achieved in some institutions, such procedures may help to launch the program.

Implications

Several important suggestions are strongly implied by the data in this study. If programs of education for family living are to be satisfactorily staffed, graduate schools must be aware of the need and develop programs to prepare such faculty. It is wasteful to attempt to provide indefinitely for the necessary breadth of education through in-service education. There has been some recognition of this problem at the graduate level, and in a few institutions some effort has been made to meet it, but there is need for further action. The tradition of specialization which has been established in the graduate school does not always redound to the advantage of education at the undergraduate level.

Faculty members who recognize their own interest but lack of preparation should not hesitate to do something about it. In an area as new and as uncharted as education for family living, there is need for pioneering effort both to develop and to teach these new courses. Through reading and study, through workshops and professional meetings, faculty should seek to fill the gaps in their own background. Participation in adult education programs, even for short periods of time, can contribute much to the development of a realistic approach to family life education. Those who engage in such activity find that in working with adults who are coping with the here and now realities of family living, they do not remain for long in an ivory tower.

Recommendations

The small college has its own particular strengths and problems. There may be only one or possibly not more than two or three staff members in the home economics department. Yet other departments in the college often have a vital interest in a sound program of education for family living. It may happen, too, in the small liberal arts college that some administrators and faculty members may be quite indifferent to such a program. How may one go about developing an effective program in the varied circumstances which may exist?

Each institution should study its own situation in order to develop a program which will harmonize with its particular goals and objectives. In a sense, every college is unique. Hence it is unwise for any college to pattern its program after that of another, no matter how excellent another program may be. The very uniqueness of each program makes it necessary for each institution to stand alone both in the solution of its problems and in planning for the future.

While it might be possible to develop a completely new program, *it is often more practical for most institutions to work from present course offerings.* The reorganization and merging of existing courses in terms of the objectives of the program are usually less disturbing to some faculty members. Several colleges reported that this procedure usually expedited approval by the curriculum committee. It also proved less disorganizing in that there was little or no change in course numbers. One institution indicated that this plan seemed less a threat to faculty members who had been educated in a more specialized and traditional area. As these persons were called upon to determine how their subject matter might contribute to the desired goals for the program, they became involved in the curriculum change in a positive way. Through this participation they were more easily educated in the basic philosophy of the program. They also felt that they had played a vital role in the planning of the new program and were proud of the contribution they had made.

Those desirous of developing a program of education for family living might well begin the initial planning with a group of competent and enthusiastic staff members. This group may be limited in numbers, but more will be accomplished than if a larger group with little or no interest undertakes the development of the program. As interest increases and other staff members become alert to what is being done, momentum will increase.

The courses making up the program of education for family living should be made intellectually challenging to college students. Unless courses related to family living are of college level and sufficiently stimulating, the program cannot hope to merit the respect of either faculty or students for very long. Discriminating and thought-provoking readings should be a part of the program for all students but especially for those superior students whose intellectual curiosity may lead them to explore certain aspects of the program more thoroughly than possible in the course time allotted.

A center should be organized for those participating in education for family living so that books, films, and other resource materials will be available to staff members. In some cases, this might well be a center shared by several colleges in an area if a central location could be found so that its scope could be broadened and its usefulness increased. Meetings and workshops could be scheduled at this center, and consultants could be available at least at intervals to work with groups on various problems of current interest.

There should also be much experimentation as to how to structure a family-centered program. If one question was asked more than any other during the course of this study, it was about family-centered teaching. This points to the need for experimentation and research. If family-centered teaching is so important, how is it done?

There are other recommendations which are not concerned with developing a program in a given situation, but which are important to the entire field of family-living education. Important among these is the fact that graduate schools have a responsibility for providing postgraduate workshops and conferences which will further education for family living. *Leaders in the field, too, have a responsibility for developing literature which will be helpful in teaching courses in family living.* The most enthusiastic teacher is handicapped by poor or inadequate textbooks; the development of effective teaching materials would contribute much to the development of stimulating courses in family living.

Institutions should be concerned with an ongoing research program to bring to general attention in higher education the value, the need, and the results of education for family living. Such education is relatively new at the college level. There is more evidence of the need for such education than there is evidence of results. Those concerned with education for family living could make a better case for themselves if they could cite tangible outcomes of these various programs. Research of this nature would also point the way to others concerned with the development of similar programs.

The small liberal arts college, then, may make an important contribution to education for family living today. Each college would do well, however, to analyze its own situation in order to discover the unique contribution it can make. Within the framework of the liberal arts college, home economics has much to contribute to such education; but, in so doing, it should not lose sight of the fundamental goals of the liberal arts college.

Basic information on heat distribution and heat patterns within the electronic range provided by this study is of importance for those who teach and for those who conduct research, either with the electronic range itself or on the food prepared with it. It could be of value to manufacturers and designers and to homemakers who use electronic ranges.

The Effect of Microwave Energy on the Internal Temperatures of Agar and Food Cylinders[1]

Helen J. Van Zante and Hisako Nakayama

Dr. Van Zante is associate professor of household equipment at Iowa State College in Ames. She has also taught science and mathematics in secondary schools and physics as well as household equipment in college. She is a member of Sigma Xi. Miss Nakayama, currently a research assistant in the Engineering Experiment Station at Iowa State College, was a graduate assistant in the household equipment department at the time of this study.

Introduction

MOST cooked foods are considered "done" when a certain temperature has been achieved within the cooked product.

A condition of similar temperatures throughout the food product is an ideal goal for the engineers who design cooking appliances such as the electronic range. Even heat distribution throughout the cavity of an oven is also to be desired.

With the appearance of the electronic range, performance problems concerning heat distribution both within the cooked product and within the oven needed investigation.

Since temperature is a factor of heat, it seemed important to investigate temperatures of a substance of controlled chemical and physical composition.

Pure nutrient agar was chosen as a heating medium since Copson (*1*) had done some work with the electronic range and had used 2.7 per cent agar cylinders.

A previous article reviewing microwave cooking has been done by Fenton (*2*). Therefore, no discussion of the nature of microwaves in cookery will be included in this article.

General Procedure

A Tappan electronic range, Model RL-1, was used. The applied voltage was held constant at 236 volts.

The magnetron current was adjusted at 330 milliamps when the electronic range was started on the "Hi" cooking speed and at 247 to 250 milliamps when operating on "Lo" cooking speed. Submitted articles (*3*), (*4*) discuss the methods of control and other techniques.

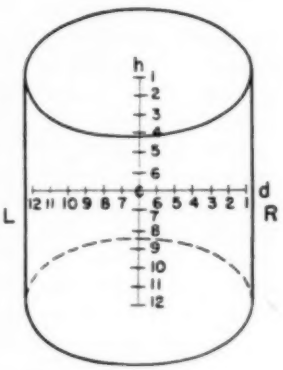


FIGURE 1. Drawing of a 3-inch agar cylinder showing the two lines (h-line and d-line) of temperature measurement through the cylinder. Also points of measurement at ¼-inch intervals along the two lines.

Agar cylinders were made of 2.7 per cent agar and 97.3 per cent water in 2-, 3-, 4-, and 6-inch sizes. The diameter through the center (C) indicated as the d-line and the vertical center line indicated as the h-line were equal in length on the same cylinder. Each cylinder was placed on a china dish in the center position of the oven at an equilibrium temperature of 34°F.

Internal temperatures were recorded by a potentiometer at every ¼ inch on the h-line and d-line. The period of temperature recording was of

[1] Journal Paper No. J3504 of the Iowa Agricultural and Home Economics Experiment Station, Ames, Iowa. Project No. 1382.

short duration, usually about 2 minutes. Recording was done immediately after removing the agar from the presence of the microwaves. All temperature measurements are shown graphically from left to right on the d-line and top (C′) to bottom (C″) on the h-line of each cylinder.

Graphical data show temperature rise from 34°F on the vertical axes for points on the d-line and h-line. Measuring points at ¼-inch intervals are shown on the horizontal axes.

Discussion

A study of temperatures within various sized agar cylinders. Chart 1 shows transverse diameter temperatures (d-line) and vertical center lines (h-line) of:

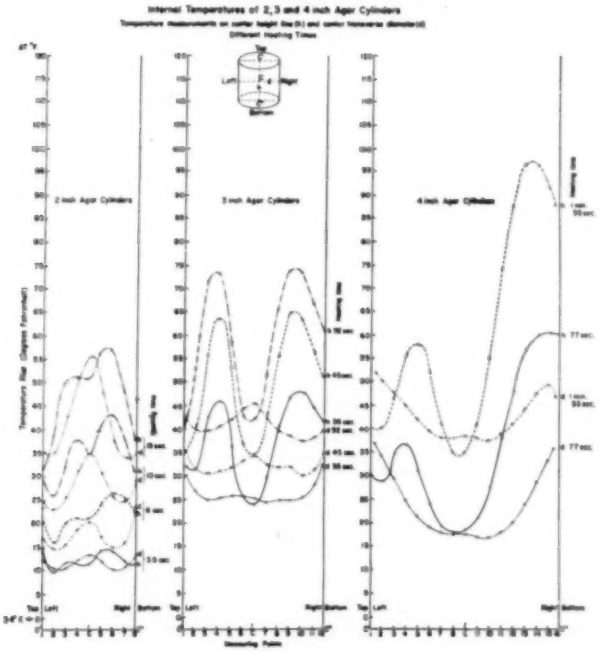
2-inch cylinders heated 3.5, 6, 10, and 15 seconds
3-inch cylinders heated 35, 43, and 52 seconds
4-inch cylinders heated 77 seconds and 1 minute 55 seconds

Chart 2 shows only the vertical center line temperatures of 6-inch agar cylinders heated 1 minute 35 seconds, 4 minutes 32 seconds, 8 minutes 30 seconds, and 10 minutes.

A study of these two charts shows:

1. Very uneven temperatures along the vertical h-line with two characteristic bilaterally symmetrical hot spots.
2. More uniform temperatures on the transverse diameter through the cylinder centers (d-line).
3. Both the d-lines and h-lines show temperatures that are almost bilaterally symmetrical. Temperatures were a little higher at the bottom of the h-line, since this was where the cylinder rested on the china plate.

Figures 2, 3, and 4 show cross sections of 2-inch agar cylinders immediately after heating. Figures 5 and 6 show the same for 3-inch agar cylinders. Figure 7 is the cross section of a 4-inch cylinder, and Figure 8 is the cross section of a 6-inch agar cylinder. The cavities represent the regions of high temperature where melting occurred. It was not possible to measure the temperature of every point within the cylinder. Hot spots, for example, show up on the 6-inch cylinder photograph that cannot be shown on chart 2. Furthermore some melting has occurred where the cylinder contacts the dish. There is agreement between the hot spots of the



CHARTS 1a, b, c (left to right). Two curves are shown for each heating time on the agar cylinder. Along the center line going from the top to the bottom of the cylinder the temperatures are very uneven.

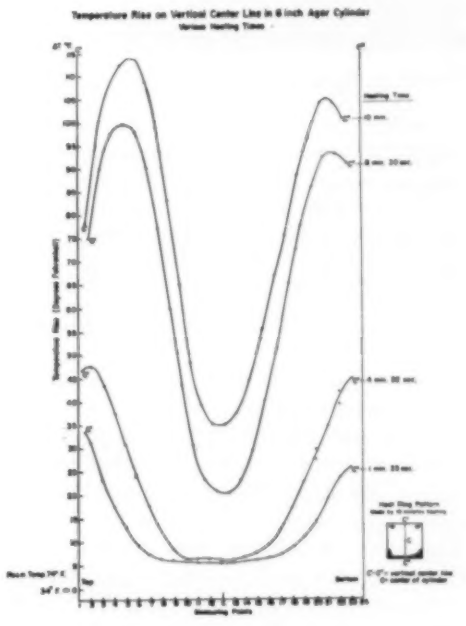


CHART 2. Temperatures in the 6-inch agar cylinder are shown only for the vertical center line (h-line). Note temperature unevenness.

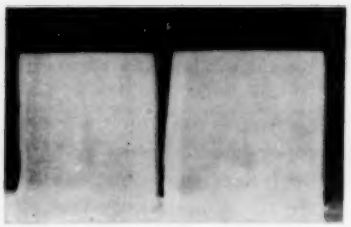


FIGURE 2. Heating time 25 seconds

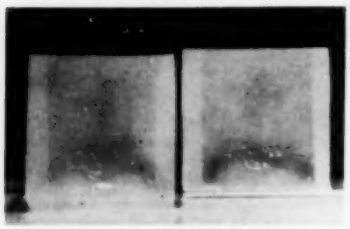


FIGURE 3. Heating time 30 seconds

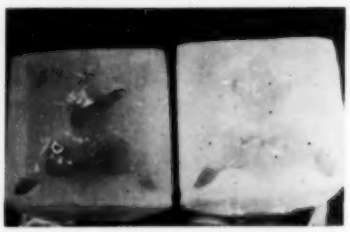


FIGURE 4. Heating time 35 seconds

FIGURES 2, 3, and 4 show cross sections of 2-inch agar cylinders heated different times and immediately after removal from the electronic range. Note the progressive growth of the cavity within the cylinder. This cavity is a result of melting due to high temperature. Compare these figures with chart 1a showing internal temperatures of similar cylinders.

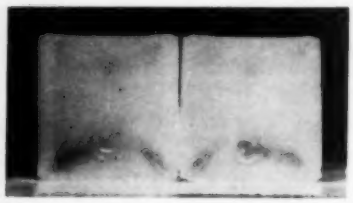


FIGURE 5. Heating time 1 minute 15 seconds

FIGURE 6. Heating time 1 minute 45 seconds

FIGURES 5 and 6 show 3-inch agar cylinder cross sections as seen shortly after removal from the electronic range. Compare with chart 1b.

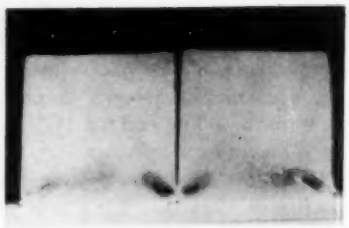


FIGURE 7. Shows the cross section of a 4-inch agar cylinder after 2 minutes and 15 seconds heating time. See chart 1c.

FIGURE 8. Shows the cross section of a 6-inch agar cylinder after 10 minutes heating time. See chart 2.

smaller cylinders as seen in the photographs and the graphs of chart 1.

Horizontal and vertical cooking positions of agar cylinders. Since the vertical and horizontal dimensions of the agar cylinders were equal, as previously noted, the shape of the cylinder was constant. Regardless of whether the cylinder was placed horizontally or vertically and heated, the temperatures measured on the vertical and horizontal axes followed practically the same distinctive pattern, as indicated in chart 3.

Furthermore, the effect of the china plate can now be seen on the d-line instead of the h-line as in the case of the erect cylinders.

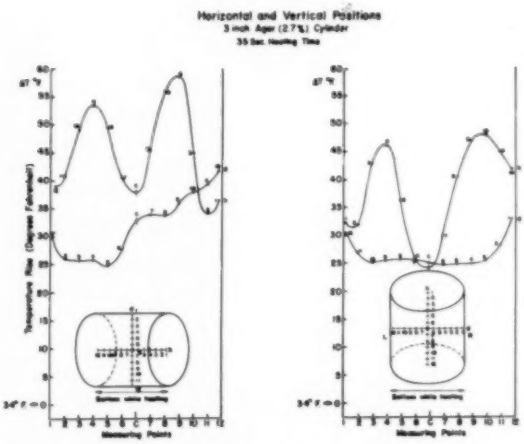


CHART 3. When heating a 3-inch agar cylinder in the electronic range, it does not make much difference whether the cylinder is lying horizontally or standing vertically. The internal temperatures on the d-line and h-line remain similar except for the differences affected by the dish upon which the cylinder rested.

"Hi" and "Lo" heating speeds. On the basis of power consumption of the electronic range, a heating time for "Lo" was calculated which would give the same temperature rise as if it were heated for

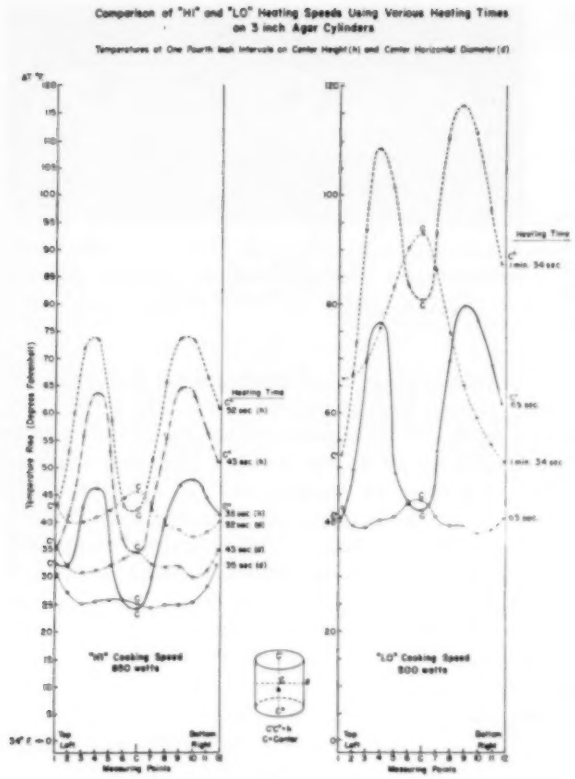

Comparison of "HI" and "LO" Heating Speeds Using Various Heating Times on 3 inch Agar Cylinders
"HI" Cooking Speed 850 watts
"LO" Cooking Speed 500 watts

CHART 4

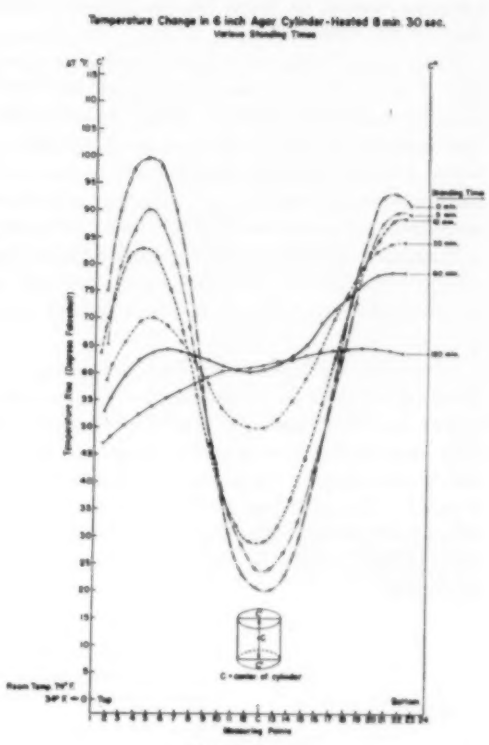


CHART 5

CHART 4. A heating time of 65 seconds on "Lo" is equivalent to a heating time of 52 seconds on "Hi."

CHART 5. If a 6-inch agar cylinder is heated in the electronic range it will come out with uneven internal temperatures. It must stand outside the range for a considerable time before a state of temperature equilibrium is achieved.

lesser time on "Hi." Heating time of 65 seconds on "Lo" was equivalent to 52 seconds on "Hi."

On chart 4, the 52-second lines for "Hi" and the 65-second lines for "Lo" are equivalent in power consumption for the heating of a 3-inch agar cylinder. Note that these lines are quite similar. But when longer heating time is used, there is a pronounced temperature variation within the 3-inch agar cylinder.

The effect of standing time on the internal temperatures of a 6-inch agar cylinder. An agar cylinder at the starting temperature of 34°F was heated 8 minutes and 30 seconds while resting on a china plate at the center of the bottom shelf. It was then removed from the oven and allowed to stand for a period of time (standing time). Temperatures were measured during a period of two hours at the intervals indicated in the table.

The temperatures were measured along the h-line since they would be more likely to vary than would those on the d-line. Room temperature was approximately 74°F.

A study of the effect of standing time on a 4-inch

Maxima and minima temperatures for the various standing times

STANDING TIME	FAHRENHEIT DEGREE RISE FROM 34° F		
	Maximum Temperature	Minimum Temperature	Difference between Maximum and Minimum Temperatures
minutes	*degrees*	*degrees*	*degrees*
0	99.5	24.3	75.2
5	89.9	24.0	65.9
10	88.5	28.8	59.7
35	84.0	50.0	34.0
60	78.5	60.4	18.1
120	64.5	60.0	4.5

agar cylinder was also made, but, since the results were so similar to those for the 6-inch cylinder, they are not included.

These data (table and chart 5) point up the fact that if a sizable cylindrically shaped food of unvaried consistency is placed in the electronic range and heated, it will come out in a condition of highly uneven internal temperature. It must stand for considerable time before a state of temperature equilibrium is achieved through heat conductivity.

Note also that the center point of the cylinder reached equilibrium temperature in one hour and an additional hour of standing time did not change it (Chart 5).

Variation of position and load size using 3 to 9 small agar cylinders. Experiments were carried out where load size and position were varied. Two-inch agar cylinders were placed in groups of 3, 5, 7, and 9 according to the positions indicated in charts 6 and 7. The cylinders were placed on a 13 x 8¼-inch glass baking dish (figure 9). Colored circles were painted on the baking dish to assure accurate placement.

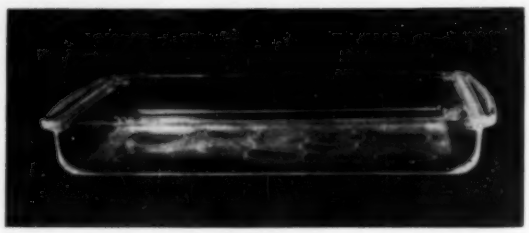


FIGURE 9. Glass baking dish (13 x 8¼ inches) with colored circles marking placement of 2-inch cylinders shown in charts 5 and 6.

Temperature measurements were taken only at the center of each cylinder.

It should be mentioned that the cylinders were heated for 10 seconds the first time, then removed and probed for temperature (*3*, *4*). They were returned to the electronic range and heated for another period of time and again removed and probed for temperature. Additional heating periods of 5 seconds were used for the 3-, 5-, and 7-cylinder loads, and 10-second heating periods were used for the 9-cylinder loads.

It is clearly obvious from the data in charts 6 and 7 that load size and position affect the heating time and internal temperature rise of each cylinder. The center cylinder seems to receive less heat when the number of total cylinders is increased or when the others are brought nearer to it.

A special problem by a graduate student (*5*) in which potatoes were baked confirmed the preceding facts. When the potato load was increased from 1 to 8, it was found necessary to move the potatoes around on the oven shelf during the cooking process in order to get them baked evenly. Because the potatoes were not confined to a baking dish, there was more area for their distribution on the shelf. Furthermore, a difference in doneness was observed among the potatoes baked at the back of the oven and those baked at the front as well as

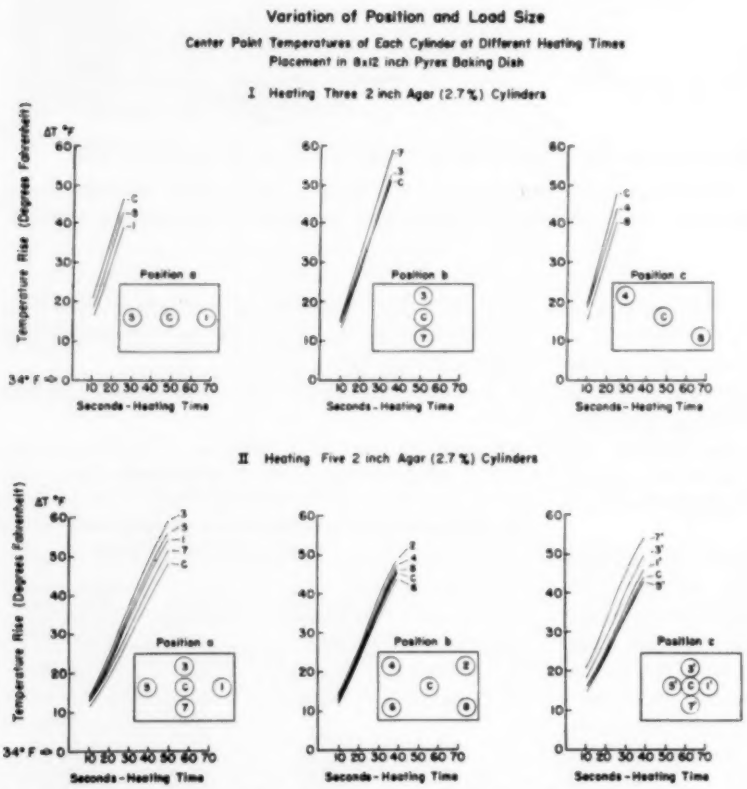

Variation of Position and Load Size
Center Point Temperatures of Each Cylinder at Different Heating Times
Placement in 8x12 inch Pyrex Baking Dish
I Heating Three 2 inch Agar (2.7%) Cylinders
II Heating Five 2 inch Agar (2.7%) Cylinders
ΔT °F
Temperature Rise (Degrees Fahrenheit)
34° F ⇒ 0
Position a
Position b
Position c
10 20 30 40 50 60 70
Seconds - Heating Time

CHART 6. As position and load change, note the effect on the center cylinder c.

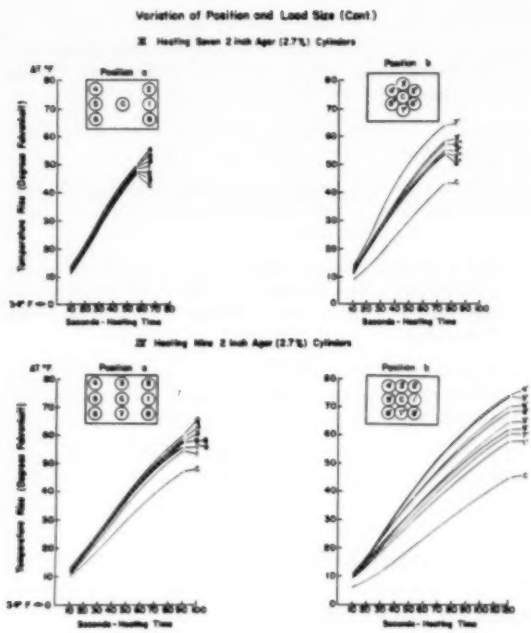


CHART 7. At left. As position and load change, note the effect on the center cylinder c.

CHART 8. Below. Food also heats unevenly, just as does the agar. There is a lack of symmetry in these curves that was present in the controlled agar curves.

among those at the right and those at the left side. Also, the degree of doneness varied with each potato.

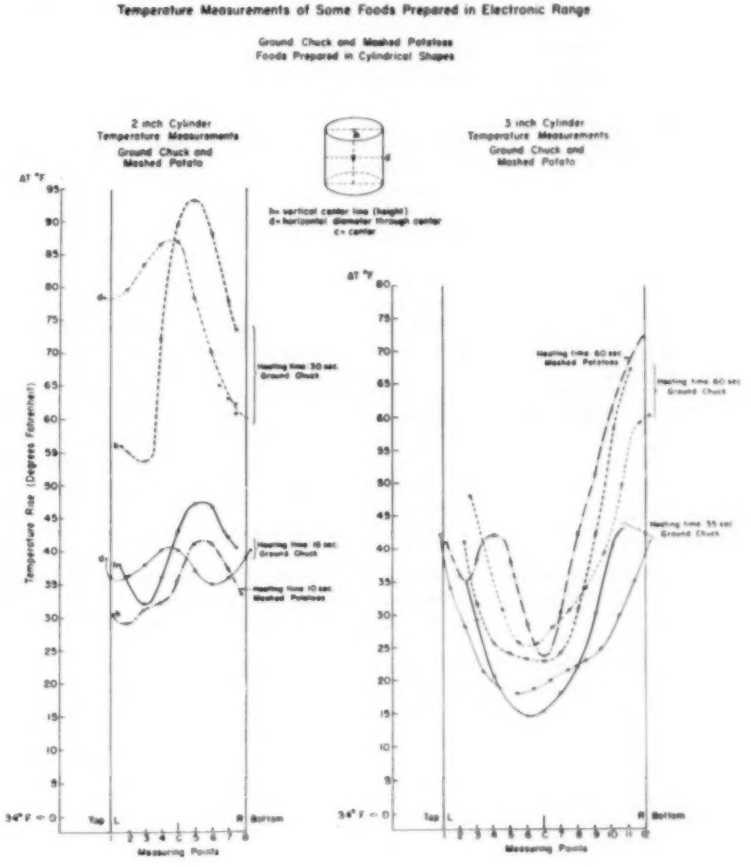
Classwork with meat patties showed uneven cooking similar to the findings with agar cylinders.

Temperature measurements of some foods prepared in the electronic range. Ground beef chuck and instant mashed potatoes were prepared in 2- and 3-inch cylinder molds and then heated on a china dish in the same manner as the agar cylinders. Chart 8 shows the temperature rose from 34°F for these foods. Temperatures at ¼-inch intervals along both h-lines and d-lines were measured.

Comparison of graphs in chart 8 with those of chart 1 shows some similarity. The variation of the food curves from the symmetry of the controlled agar curves is caused possibly by the physical and chemical characteristics of the food itself. There is ample evidence of uneven heating of the food.

Other Studies

Differences in water content of the heating medium and also comparison of the electronic range with the conventional electric range have been observed. These results appear in other submitted articles (*3*), (*4*). Differences in cooking container shapes and materials have also been included in these articles.



Summary

Under the influence of microwave heating in the electronic range:

1. **Uneven heating occurs within similarly shaped and constituted agar cylinders.**
2. **Shape is more important than horizontal or vertical heating position of an agar cylinder.**
3. **The temperature rise in the agar cylinders was independent of heating speed but dependent upon total energy input.**
4. **Considerable standing time after removal from the electronic range is required for a 6-inch agar cylinder to reach a state of temperature equilibrium.**
5. **Load size and position affect the cooking time and heating of each individual portion of the load.**
6. **Two foods heated for short periods of time in the electronic range showed differences from agar cylinders caused by their chemical and physical nature.**

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1. Copson, D. A. Microwave energy in food procedures. IRE Transactions of the Professional Group on Medical Electronics. Vol. PGME-4 (Feb. 1956), pp. 27-35.
2. Fenton, F. Research on electronic cooking. *J. Home Econ.* **49**, No. 9 (Nov. 1957), pp. 709-716.
3. Van Zante, H. J. Paper on techniques, methods of control, and temperature measurement in electronic range research. Article submitted to *J. Home Econ.*
4. Van Zante, H. J., and Nakayama, H. Paper on utensils in electronic range cookery and the electronic range vs. conventional electric oven. Article submitted to *Food Technology.*
5. Bryant, S. Baking potatoes in the electronic range. Unpublished paper, Iowa State College, Dept. of Household Equipment, 1958.

Tentative Program–50th Annual Meeting

American Home Economics Association

Milwaukee, Wisconsin, June 23-26, 1959

Monday June 22	**Executive board meeting**
	State presidents' and councilors' unit of AHEA
	Joint luncheon and meeting of executive board and state presidents' and councilors' unit
	Special meetings of AHEA committee and section officers or committees
	Registration begins
	College clubs mixer
Tuesday June 23	**10:00 a.m. to 12 noon—General session**
	2:00 to 3:30 p.m.—General subject-matter session: family relations and child development; food and nutrition; housing and household equipment
	4:00 to 5:00 p.m.—Individual subject-matter section meetings
	8:00 p.m.—Evening of *Gemütlichkeit*
Wednesday June 24	**9:00 to 10:30 a.m.—General subject-matter session: art; family economics and home management; textiles and clothing**
	11:00 a.m. to 12 noon—Individual subject-matter section meetings
	College clubs business meeting
	12:30 to 2:30 p.m.—50th Anniversary luncheon
	2:30 to 5:00 p.m.—Visit exhibits
	8:00 p.m.—General session (Open to the public)
Thursday June 25	**9:00 a.m. to 12 noon—Professional section meetings**
	2:00 p.m.—Assembly of delegates
	8:00 p.m.—Idea Theater: 50th Anniversary presentation
Friday June 26	**8:30 to 10:00 a.m.—Visit exhibits**
	10:00 a.m. to 12 noon—General session
	1:30 to 3:30 p.m.—State presidents' and councilors' unit
	2:00 p.m.—Professional trips
Saturday June 27	**Executive board**

The contribution that this paper makes to studies of family expenditures and living patterns will be welcomed by economists and researchers as well as home economists who are concerned with patterns of financial management of families, both urban and rural.

A Factor Analysis of Expenditures of Illinois Farm Families

Richard D. Millican

Mr. Millican is an associate professor in the department of marketing, College of Commerce and Business Administration, University of Illinois. This study covers the period 1946-57.

SINCE 1928, the department of home economics at the University of Illinois has been keeping expenditure records of selected farm families. Although the number and representation of these families keeps changing, the continuation of records over extended periods of time affords an opportunity to make a time-series analysis of the income and expenditures of part of the sample.[1]

The purpose of the factor analysis was to test the hypothesis that certain groupings of family characteristics exist and that these groupings have some relationship to expenditures either in a given year or a period of years. If it could be determined that certain factors were stable over time, then it would be possible to determine whether or not certain relationships existed between family characteristics and expenditures for certain classifications of goods over time. Therefore, it was necessary to determine what factors existed and were stable over a period of years; then, what expenditures were stable within the factor structure itself.

Unlike urban families, the farm family is both a business and consumption unit. A number of expenditures are mixed; that is, the expenditure for rent of the farm home is both a production and consumption expenditure. The apportionment known as Disposable Cash Farm Outlay, or those dollars used directly for expenditures, serves in this study as a figure closely related or having a direct bearing upon current income.

Selection of the sample. Since an effort in this analysis was made to obtain a continuing study over time, only those families were used which had records continuous for the 12-year period, 1946 through 1957. Sixty-nine families were found for the period 1946-55, but ten of these dropped out in the 1956-57 period, and the sample was thereby reduced to 59.

Account-keeping farm families are not representative of the total farm population of Illinois, according to a statistical study made by the U. S. Department of Agriculture.[2] As an example of differences in economic level, total farm outlay for account-keeping families averaged about $5,250 (1946), while the average of the total farm population was $3,200.[3]

Interpretation of factors. Since factor analysis is a series of structural unities and can use a large number of variables, 36 were selected. It must be recognized for purposes of empirical testing that certain variables are selected which other studies[4] have used since they represent the sources of data both for the family characteristics and the expenditures. In this study, some additional variables were used in order to enlarge the list serving to make the factoring more comprehensive.

For each of the 12 years, the correlation matrix for the 36 variables was determined. Six centroid factors were extracted from each of these matrices. These centroids were then rotated obliquely ac-

[1] Research funds supplied by the Graduate Research Board, University of Illinois.

[2] J. L. Pennock, M. L. Brew, and R. C. Trillinghast, Farm Family Spending and Saving in Illinois. Home Econ. Research Branch, Agr. Research Service, U. S. Dept. Agr. Bull. No. 101, 1954, p. 19.

[3] *Ibid.*, p. 19.

[4] R. C. Freeman and R. E. Deacon, Family Cash Living and Other Outlays as Related to Gross Cash Receipts. Univ. Ill. Agr. Expt. Sta. Bull. No. 614.

cording to the criteria proposed by C. Pinzka and D. R. Saunders.[5] It is entirely possible that more factoring could have been done, but the size of the sample and the observations of the results after six factors had been extracted indicated that the stable factors over time had been clearly indicated.

Six Factors

The six factors which were discovered by a rotated oblique solution with their appropriate identification and explanation follow:

Factor I: Family size. Identification of factors was based upon observation of the numerical coefficients of the loadings of the 36 variables, plus the consistency of these loadings over the period.

At least two approaches to the analysis are possible: one, a recurrence of high factor loadings for any one variable over time, or group of variables, or two, the individual pattern of the matched factor for each year.

This factor did recur in all but two years, 1952 and 1957. The family-size variable, which represents the total number of persons of all ages in the family, was fairly consistent between the years 1946 and 1951 (+0.74 to +0.43 range). From 1953 to 1957, there was a sharp decline in the loadings (+0.09 in 1957).

This indicates a change in the importance of family size with respect to this factor as time goes on since the younger members of the family mature and then leave the household. Therefore, it would be expected that, with the same families, family size would in time disappear as a variable as it nearly does in 1957.

In the case of expenditures, *food purchased* is important in the early years of the family, but as time goes on it shows a decline in importance in this factor (from +0.57 to +0.08). *Clothing* also shows the same pattern (+0.66 to +0.04). It can be concluded that this factor would be of declining significance over time and would in turn affect expenditures in a similar manner.

Other expenditures show inconsistencies in that they appeared at times and then disappeared or dropped to very low loadings. An example of this kind of expenditure was demonstrated by *personal care*, which at first was not important, then in 1950 assumed a loading of +0.72, only to decline to a −0.14 in 1956. These variations can be accounted for by the change in the family pattern and in the structure of other factors which have a more pronounced effect, as will be noted in later descriptions.

Factor II: Older family. This factor was sporadic in that it showed gaps in 1947, 1953, 1954, and 1957. It was marked by the high factor loadings for the older children variable, especially those in the 19 to 22 age bracket. Pronounced influence was noted also by the teen-age bracket, 14 to 18. At least in the period 1948 to 1952, inclusive, there were wide fluctuations in the variable for those children in the 19 to 22 bracket, and this same pattern was demonstrated in expenditures for *clothing*, *personal care*, and *education*. These patterns indicated that other characteristics affected these expenditures in certain years, or a marked decline in their importance occurred for those years. That is, those expenditures which were important to older children were given a secondary place in the choices in the budget. This was especially noticeable in 1950, when large negative loadings occurred which had been positive in previous years. But in 1952 their importance was resumed as noted by the upward swing in loadings (+0.38 to +0.48 for *clothing* and to +0.54 for *personal care*). In 1955 and 1956, *education* apparently was no longer an important variable, nor was *personal care*, but *clothing* remained high. It could be assumed that many of the minor expenses were handled by the children themselves earning money at part-time jobs.

It was demonstrated that there were wide fluctuations in this factor, but it was recognized as representative of a change in the size and structure of the family, and a corollary to the Family Size factor over a period of time.

Factor III: Age and marriage cycle. This was the most stable factor over the 12-year period. The gradual increase in the ages of husband and wife plus the length of time of the marriage showed high loadings over the 12-year period.

Expenditures did not show any consistent pattern in this factor. The influence of age is indirect in that it influences family size and possibly income. The only expenditure which showed any pattern was that of *gifts* which declined in importance beginning in 1954 (See table 1). However, there were some trends in *food purchased* and *meals out* that were in inverse order. *Food purchased* showed a negative correlation in all years but one (1954), and the negative loadings tended to increase as age increased, as was to be expected. Similarly *meals out* was negative in all years, and the size of the loadings (about −0.20) operated within a narrow range. *Clothing* expenditures were

[5] Research Bulletin, Educational Testing Service, Princeton, N. J., 1954 (unpublished).

also negative, and the size of the loadings tended to increase, especially in 1956 and 1957.

In the Age Factor, then, it was shown that some of the principal expenditures tended to decrease in importance as age increased; that is, they had negative correlations in this factor. Near the end of the 12-year period, this trend was more pronounced as the children matured and left home, permitting a change in the size and scope of the expenditures made by the head of the household and his wife.

Factor IV: Savings. This factor which indicated loadings mainly for the income of past years (three years back was computed) indicated wide fluctuations in the 12-year pattern. These changes were indicative of changes in income and the amounts saved in good and bad years. Low points were noted in 1947 and 1948, 1953 and 1954, and 1956. High points were noted in 1950 to 1952 and in 1957 (See table 2).

The most consistent expenditure—the one which most closely followed these changes—was that of *charity*. The loadings for this expenditure rose and fell with the loadings of *savings*. Apparently these families considered this expenditure one of the highly elastic type. When times were good and money had been saved, high donations were given to churches and other charity groups. When times were poor, this expenditure was quickly curtailed.

Gifts also seemed to be somewhat sensitive to these changes but not to the degree noted in *charity*. Operating expenses were also somewhat affected by these changes. *Clothing* also showed high loadings when the savings factor was high; this was especially noted in the 1949 to 1952 years consistent with the high point in savings in the 12-year period. This would seem to indicate that *clothing* expenditures are somewhat elastic when savings from past years are considered. Food expenditures were unrelated to savings.

Factor V: Education. A stable factor over time was that of education, the level of education achieved by both husband and wife. The factor loadings for the husband's education were con-

TABLE 1

Factor III: Age and marriage cycle. Rotated factor loadings [1946 to 1957]

VARIABLE DISPOSABLE CASH	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
1. Farm outlay—3	+0.08	+0.10	+0.26	+0.20	−0.04	+0.05	+0.08	+0.07	+0.02	−0.02	+0.00	+0.10
2. Farm outlay—2	+ .04	+ .33	+ .10	+ .01	+ .07	+ .04	+ .14	+ .09	+ .11	+ .06	− .04	− .04
3. Farm outlay—1	+ .11	+ .09	− .11	+ .06	+ .04	+ .13	+ .09	+ .04	− .11	− .11	+ .10	+ .19
4. Farm outlay	+ .03	− .02	− .02	− .00	+ .01	+ .04	+ .07	− .09	− .01	− .03	+ .05	− .07
5. Change in DCFO*—2	− .01	− .27	− .10	− .00	− .03	− .03	− .08	− .18	− .13	+ .12	+ .11	− .06
6. Change in DCFO*—1	− .07	− .09	+ .13	− .03	− .05	− .09	− .01	− .12	+ .07	+ .13	+ .04	− .18
7. Age of husband	+ .86	+ .75	+ .82	+ .74	+ .75	+ .69	+ .68	+ .79	+ .75	+ .73	+ .37	+ .29
8. Age of wife	+ .76	+ .80	+ .86	+ .84	+ .85	+ .81	+ .84	+ .58	+ .75	+ .71	+ .79	+ .74
9. Marriage cycle	+ .82	+ .82	+ .83	+ .75	+ .84	+ .82	+ .85	+ .66	+ .76	+ .76	+ .74	+ .72
10. Education of husband	− .01	− .12	+ .08	+ .05	+ .09	+ .08	+ .09	+ .45	+ .14	+ .10	+ .03	− .03
11. Education of wife	− .02	− .02	+ .14	+ .04	+ .04	− .01	+ .07	+ .19	+ .03	− .04	+ .17	+ .03
12. Children under 5	− .29	− .57	− .56	− .57	− .58	− .58	− .57	− .28	− .33	− .31	− .36	− .18
13. Children 5 to 10	+ .07	− .40	− .34	− .15	− .12	− .45	− .55	− .26	− .36	− .53	− .54	− .36
14. Children 14 to 18	+ .18	+ .26	+ .10	+ .11	+ .08	− .00	+ .05	+ .00	+ .08	− .05	− .24	− .60
15. Children 19 to 22	+ .08	+ .36	+ .23	+ .09	− .01	+ .03	+ .17	+ .19	+ .07	+ .17	+ .05	− .43
16. Adults over 22	− .02	− .02	+ .26	+ .23	+ .22	+ .10	+ .04	+ .27	+ .03	+ .11	− .23	− .14
17. Total family size	+ .08	− .28	− .21	− .14	− .25	− .39	− .39	+ .01	− .17	− .32	− .63	− .75
18. No. of organizations	+ .11	+ .08	+ .14	+ .11	+ .06	+ .17	− .01	− .06	− .07	− .05	− .28	− .18
19. Miles to shopping ctr.	+ .16	− .06	+ .20	+ .23	+ .23	+ .27	+ .27	+ .33	− .08	+ .04	+ .06	− .11
20. Acres farmed	+ .19	− .03	− .02	− .02	+ .02	+ .02	− .01	+ .15	+ .19	+ .15	− .10	− .29
21. Population of shopping center	+ .16	+ .15	+ .29	+ .33	+ .20	+ .32	+ .38	+ .21	− .06	+ .11	+ .33	+ .17
22. Food purchased	− .29	− .33	− .32	− .19	− .20	− .20	− .24	− .03	+ .16	− .21	− .45	− .49
23. Meals out	− .21	− .18	− .11	− .09	− .21	− .26	− .15	− .13	− .36	− .16	− .21	− .25
24. Operating expense	− .01	− .01	+ .06	− .06	− .15	− .09	− .14	+ .07	− .05	− .03	− .13	− .26
25. Housing	+ .11	− .02	+ .19	+ .05	− .02	− .04	− .15	− .03	+ .01	+ .35	+ .13	+ .18
26. House furnishings	− .32	− .05	− .05	− .09	− .00	− .10	+ .05	+ .12	+ .17	+ .06	− .01	− .03
27. Life insurance	− .02	− .13	− .12	− .16	− .01	− .14	− .10	− .03	− .10	− .15	− .07	− .04
28. Other savings	+ .13	+ .08	+ .10	+ .03	+ .17	+ .10	+ .01	− .04	+ .05	+ .01	+ .05	+ .19
29. Clothing	− .14	− .00	− .23	− .08	− .14	− .05	− .26	− .18	− .07	− .15	− .28	− .52
30. Personal care	− .02	+ .16	− .02	+ .16	+ .04	+ .10	+ .01	− .02	− .07	+ .13	− .14	− .13
31. Transportation	+ .05	+ .09	+ .07	− .03	+ .03	− .04	+ .21	+ .05	+ .12	+ .13	+ .37	+ .10
32. Medical care	+ .03	+ .07	+ .04	− .12	− .09	+ .05	+ .26	+ .05	+ .09	+ .18	+ .16	− .17
33. Recreation	− .17	+ .17	+ .05	− .11	+ .04	− .00	− .13	− .14	− .01	− .03	+ .05	+ .09
34. Education	+ .03	+ .29	+ .12	+ .14	+ .11	+ .18	+ .05	− .20	− .05	+ .04	+ .04	− .46
35. Charity	+ .01	+ .09	− .04	+ .10	+ .03	− .04	+ .07	− .06	+ .13	− .04	+ .22	+ .05
36. Gifts	+ .20	+ .34	+ .29	+ .13	+ .16	+ .34	+ .14	+ .19	− .08	− .10	+ .03	+ .17

* Disposable Cash Farm Outlay

sistently higher than those of the wife, but more significant was the consistency of the trend line in both cases. The only expenditure which followed the trend of the factor loadings for education was that of *meals out*. This is now considered a mixed expenditure in that it is both food consumption and entertainment or recreation.

Another expenditure which was at least related to the earlier years prior to 1950 was that of *life insurance*. It is natural that this expenditure would assume decreasing importance once policies had been purchased.

Transportation was a sporadic expenditure ranging from a −0.30 to a +0.40 factor loading. The high varying costs of this expenditure, especially when the time comes for replacement of a car, would account for this wide variance.

Factor VI: Income. The sixth factor was that of income, or the current disposable cash farm outlay. This factor was not consistent until 1949 since past income dominated expenditures in the last few years of the 1940 decade. It must be pointed out that a consistency between the current outlay and savings was apparent. With fluctuations in income, fluctuations occurred in savings. A peak was reached in 1953, followed by a drop, and then a rise in the period 1955 to 1957.

At the peak of the factor loadings for income (1953) was also a peak for *housing* and *house furnishings*, but in other years there was no apparent relationship.

Findings

Two findings of interest were reflected from the observations of these farm families' economic behavior:

1. Factors were quite stable over the 12-year period. Of the 72 factors that were extracted, 6 for each of the 12 years, only 5 could not be identified or be fitted into the pattern already established. Those established in the early years had breaks for a year or two, especially those connected with the family size and age of the children. This would be true as growing children would gradu-

TABLE 2

Factor IV: Savings. Rotated factor loadings [1946 to 1957]

VARIABLE DISPOSABLE CASH	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
1. Farm outlay—3	+0.86	+0.33	+0.13	+0.59	+0.78	+0.81	−0.31	+0.48	+0.35	+0.35	+0.51	+0.61
2. Farm outlay—2	+ .83	+ .12	+ .72	+ .81	+ .52	+ .83	+ .77	+ .63	+ .30	+ .59	+ .31	+ .41
3. Farm outlay—1	+ .33	+ .64	+ .70	+ .78	+ .69	+ .75	+ .58	+ .25	+ .73	+ .73	+ .34	+ .78
4. Farm outlay	+ .00	+ .10	+ .36	+ .53	+ .81	+ .64	+ .71	+ .19	+ .68	+ .23	+ .08	+ .22
5. Change in DCFO*—2	− .73	+ .03	− .24	− .20	+ .20	− .43	− .23	− .36	+ .38	− .33	− .10	− .17
6. Change in DCFO*—1	− .23	− .49	− .27	− .28	+ .03	− .24	+ .20	− .04	− .13	− .43	− .19	− .60
7. Age of husband	+ .09	+ .05	+ .03	+ .06	− .18	− .05	+ .07	+ .09	− .15	− .19	+ .15	− .09
8. Age of wife	+ .11	− .01	+ .10	− .01	+ .03	− .10	+ .05	+ .05	− .06	− .11	− .11	+ .04
9. Marriage cycle	+ .10	+ .10	+ .01	+ .12	+ .09	+ .11	+ .15	+ .10	+ .05	+ .04	− .02	+ .15
10. Education of husband	+ .40	− .15	− .15	− .18	− .27	− .06	− .09	+ .10	+ .10	− .13	+ .18	+ .00
11. Education of wife	+ .34	− .27	− .38	− .34	− .17	− .08	− .24	− .03	+ .09	− .19	− .04	− .10
12. Children under 5	− .04	− .19	− .09	− .26	− .27	− .21	− .22	− .03	− .07	− .17	− .06	− .03
13. Children 5 to 13	− .04	+ .07	+ .02	+ .11	+ .15	+ .05	+ .04	+ .12	− .15	− .04	+ .07	− .08
14. Children 14 to 18	− .23	+ .01	− .21	− .07	− .01	− .12	− .06	− .28	− .08	+ .00	− .34	− .18
15. Children 19 to 22	− .14	− .29	− .01	+ .03	+ .05	+ .00	+ .06	− .23	+ .17	− .09	+ .08	− .08
16. Adults over 22	+ .29	+ .40	+ .27	+ .08	− .24	+ .14	+ .13	+ .09	+ .17	− .06	+ .37	+ .08
17. Total family size	− .23	+ .05	− .07	− .04	− .09	− .02	− .02	− .17	− .10	− .17	− .04	− .15
18. No. of organizations	− .14	+ .15	− .25	− .28	− .17	− .23	− .10	− .17	− .10	− .13	− .05	+ .27
19. Miles to shopping ctr.	− .11	+ .11	+ .03	− .16	− .04	− .13	− .06	− .17	+ .12	+ .05	+ .11	− .22
20. Acres farmed	− .00	+ .27	+ .15	+ .26	+ .10	+ .40	+ .46	+ .10	+ .26	+ .23	− .24	+ .23
21. Population of shopping center	− .05	− .00	+ .04	− .19	+ .10	− .16	− .07	− .30	+ .32	+ .15	+ .11	− .04
22. Food purchased	+ .14	+ .05	+ .18	+ .19	+ .09	+ .06	+ .15	+ .13	+ .23	+ .19	+ .28	+ .18
23. Meals out	+ .10	+ .02	+ .19	− .04	+ .19	+ .14	+ .07	+ .29	+ .23	+ .05	+ .34	− .12
24. Operating expense	+ .41	+ .24	+ .23	+ .15	+ .04	+ .19	+ .21	+ .18	+ .52	+ .09	+ .14	+ .41
25. Housing	+ .01	− .13	+ .19	+ .01	+ .06	− .04	+ .10	− .05	+ .15	− .09	− .08	+ .19
26. House furnishings	− .01	− .33	+ .17	+ .18	+ .44	+ .42	+ .56	+ .22	+ .25	+ .12	+ .03	+ .40
27. Life insurance	+ .27	+ .03	+ .08	+ .09	− .12	+ .36	+ .07	− .01	+ .03	− .03	+ .62	+ .03
28. Other savings	+ .01	+ .21	+ .21	+ .51	+ .45	+ .34	+ .32	− .01	+ .50	+ .02	− .05	+ .12
29. Clothing	+ .03	+ .05	+ .10	+ .53	+ .26	+ .27	+ .36	+ .12	+ .18	+ .41	+ .06	+ .08
30. Personal care	− .21	− .21	+ .03	+ .01	− .05	+ .08	+ .03	+ .10	+ .44	+ .04	+ .56	− .01
31. Transportation	+ .31	+ .14	+ .09	− .01	+ .09	− .10	+ .03	+ .05	− .07	+ .26	− .06	− .04
32. Medical care	+ .05	+ .11	+ .11	+ .29	+ .14	+ .04	− .02	+ .12	+ .09	+ .20	+ .28	+ .06
33. Recreation	+ .33	+ .01	+ .09	+ .19	+ .24	+ .31	+ .31	+ .12	− .07	+ .21	+ .57	+ .06
34. Education	− .03	− .21	− .04	+ .13	+ .06	− .06	+ .01	− .02	− .08	+ .01	− .01	− .03
35. Charity	+ .33	+ .35	+ .55	+ .62	+ .82	+ .88	+ .80	+ .32	+ .55	+ .66	+ .05	+ .67
36. Gifts	+ .67	− .06	+ .11	+ .05	+ .04	+ .16	+ .32	+ .47	+ .22	+ .29	+ .19	− .18

* Disposable Cash Farm Outlay

ally change the factor structure and eventually change the whole pattern of the factor or eliminate it.

The most stable factor with continual high loadings was that of age and the marriage cycle. This factor in reality is measuring the passage of time rather than a relationship to specific expenditures, hence is really the time factor. It would seem that this factor, although stable, occupied a recessive position in relation to expenditures. It is more indirect in its function. For example, when parents become 40 rather than 35, is this change in age related to expenditures or is it change in income, family size, savings, or age of the children that is associated with changes in expenditures? The factors would seem to indicate that the latter is true.

A rather interesting finding, then, is that a factor analysis of the same families over a period of time does show a fairly definite pattern of factors which are readily identified as part of the family pattern. The most steady, since it is the one about which the family can do nothing, is the aging process brought on by the passage of time.

2. The second finding of interest is that in few instances is there a consistent pattern of expenditure. The relationship of *savings* to *charity* expenditure is an outstanding exception. This finding would seem to indicate that attempts to plot expenditures into the future would be made only with a high degree of error. The extreme variability of income, savings, and changes in the family itself would preclude year-to-year predictions. The low factor loadings for food purchases, medical care, and personal care, for example, are indicative of the fact that these are highly insensitive items to the variability noted, and, therefore, some level of expected purchases could be considered as a continuing possibility of time.

On the other hand, a year-to-year analysis offers some interesting observations with respect to expenditures if no more than to emphasize the changes in choices when the factor loadings of the family characteristics fluctuate, as indicated in *savings* or *income*. But it would be extremely difficult to predict these choice patterns unless individual families could be studied, and even these might not possess enough degree of similarity in the factor structure upon which any predictive pattern could be established.

Doctoral Thesis Abstract

(Released for publication after the textiles and clothing abstracts went to press)

Performance of Resin Treated and Non-Resin Treated Percale under Controlled and Uncontrolled Laundering Methods as Related to Consumer Satisfaction. JEWEL GOLDEN, *Florida State University.*

The purpose of this study was to determine the performance of 69 resin-treated and non-resin-treated cotton percale skirts under controlled and uncontrolled laundering methods, and to relate the laboratory findings to the use practices and satisfaction of the sample subjects.

The investigation was based on the general hypothesis that cotton percale having specified resin finishes will, during the "primary use of the garment," require less time for upkeep and will give greater consumer satisfaction than non-resin-treated percales.

The test fabrics were three 80-square cotton percales, alike in composition except for final finishing treatment. The test garments were gathered skirts. The subjects were 20 pre-teen-age girls who wore a set of 3 skirts each (one skirt from each of the 3 test fabrics), over a period of 20 weeks, and their mothers who laundered the skirts by their accustomed methods. The mothers kept records of procedures used and the exact time required for ironing each skirt after each of 10 launderings. Two other pre-teen-age subjects wore skirts which were laundered in the laboratory by controlled methods along with one set of skirts which were not worn.

Swatches of fabric taken from concealed panels placed in all skirts were subjected to routine laboratory testing after 1, 3, 5, and 10 launderings.

Subjective evaluations of the appearance of the home-laundered skirts indicated that regardless of laundering methods used, there was a smoother appearance for the two resin-treated cottons than for the non-resin-treated control fabric. At the beginning of the study, type I, which was resin treated for minimum care, gave a smoother appearance than type II, which was resin treated for wrinkle resistance only. With later launderings subjective ratings did not differentiate the two resin finishes.

Processed data indicated that there was a highly significant difference in ironing time between the resin-treated and non-resin-treated skirts. Time required for ironing resin-treated skirts was reduced 20 to 40 per cent over non-resin-treated skirts during 10 launderings.

Interviews, along with the laboratory data, subjected to the "t" test for significance of difference, supported the hypothesis that resin-treated fabrics require less time for upkeep and give greater consumer satisfaction than do non-resin-treated fabrics.

With the coming of the various man-made fibers, new attempts are being made to defeat some of the age-old problems of textile durability under certain adverse conditions. This research follows fabrics of both old and new fibers in their reaction to exposure to weathering.

Weathering of Marquisettes

Hazel T. Stevens, Helen L. Richey, and Marguerite Reeves

This research was conducted in the textile laboratory of Florida State University. Dr. Stevens is head of the department and director of research in the department of clothing and textiles. Miss Richey is assistant professor of clothing and textiles, and Mrs. Reeves was a graduate assistant when this study was made.

Synopsis

THIRTEEN fabrics, mainly marquisettes in acrylic, acetate, cotton, polyesters, nylon, and rayon, were weathered under outdoor and storage conditions on the Gulf Coast and inland 40 miles. One set was exposed for six months from April to October. A second experimental group had a set exposed for three spring months and duplicate sets of fabrics for the three fall months. No appreciable difference in degradation was found between the exposures at the coast and inland 40 miles for indoor storage conditions. In general, the same was true for the outdoor exposure. Only the two acrylic fabrics retained an appreciable strength for outdoor exposure for six months. The fabrics showed greater degradation in the spring than in the fall. The acrylic marquisette retained the most strength, 70 and 73 per cent, respectively. Viscose and acetate retained no strength in the spring, while the rest were only 14 to 41 per cent of the original strength. In the fall, again viscose and acetate retained the least strength, 25 and 18 per cent, while, with the exception of the acrylic fabric, the rest ranged from 32 to 48 per cent strength retained.

Introduction

The types of fibers available to the consumer are increasing rapidly. In order to know the possibilities and limitations of each fiber, extensive testing must be done. One of the qualities which a fiber needs in order to be used successfully, particularly in the southern area, is resistance to degradation by weathering. This degradation includes damage from ultraviolet light, rain, wind, possibly salt water spray, and fumes from manufacturing plants. Some work has been done with each individual fiber in different sections of the country. No work has been done previously in the South with all these fibers. It should be remembered that the climatic conditions are such that a large portion of these fabrics are exposed to natural weathering in most of the homes.

Most of the previous work which has been done with the degradation of fabrics has been with the plain weave. However, some of the household textiles which are exposed to degradation by natural weathering are the glass curtains which are used at the windows. Many of these glass curtains are made of fabrics of the marquisette weave or weaves of thin fabrics used as casement curtains. This research deals with several different fibers mainly in the marquisette weave under natural weathering conditions.

Review of Literature

Kinds of weathering—Curtain fabrics are in the nature of their use in the home exposed at intervals to weathering conditions. These conditions vary according to the location of the home and the type of living which goes on within the home. The different weathering conditions to which curtains may be exposed include temperature, relative humidity, light of various wave lengths, contamination particles in the air (both indoor and outdoor), and the growth of microorganisms where conditions are favorable.

After a study of the literature on weathering for a period covering publications from 1920 to 1948, Appleby (*1*) summarized the investigations of actinism on textiles by saying that the following appeared as factors to be considered, controlled, and reported for maximum certainty and reproducibility of findings:

1. Character and intensity of light
2. Atmospheric conditions—content, temperature, moisture, air currents
3. Manner of mounting samples to be irradiated
4. Complete specifications of yarn and/or fabric
5. Knowledge of sample prehistory

In his statement of the work done at the Naval Clothing Depot, Maas (*2*) shows that of all the factors of weathering, sunlight and intense atmospheric pollution are the most potent in their deteriorating effect. The range of temperature, alternate wetting and drying, and intensity of winds as well as sunlight and air pollution were included by Bayley (*3*). Also, he gives as part of the physical causes of physical deterioration the flexing, rubbing, and tension caused by winds. He states that damage may also be caused by the abrasive effect of dust particles.

According to Rose and Bayley (*4*), the problem of resistance to outdoor exposure is one which has an important bearing in the consumer field. As is generally known, there is a very large annual waste of fabrics, chiefly of cotton. This is because of exposure outdoors to the complex circumstances of deterioration usually referred to as weathering.

Fabric construction—A number of studies have been made concerning the differences in response of various kinds of fabrics to the different weather conditions. As Whittaker (*5*) states in his study on exposure of casement cloth fabrics, photodegradation is a surface phenomenon and the surface of the yarn in a net construction is more exposed than is that of the yarn in a closely woven fabric. In his experiments he found that the net constructions were degraded six times as fast as were the closely woven ones.

Meteorological conditions—In observing meteorological conditions during exposures in cities of Texas and South Florida, Backer and Harwood (*6*) found evidence of uniform fading throughout the summer of 1943, while in cities in Maine and Pennsylvania poor reproducibility was observed. A definite factor leading to maximum fading in the location studied was simply the average number of sun hours striking the sample. Hialeah, Florida, reported a moderate number of sun hours accompanied by extremely high temperatures and humidity with resultant high rates of fading. Maximum sun hours alone did not provide maximum fading when accompanied by low average humidities and temperatures during the exposure periods.

Grimes (*7*) gave as her maximum decomposition at College Station, Texas, 10.81 milligrams by the oxalic method. Her conclusion was that a high maximum ultraviolet radiation of sunlight probably occurs at College Station during the summer because of the long, dry, and sunny summers. From a study by the same oxalic acid method made by Richey (*8*) on the intensity of the actinic rays in Tallahassee, Florida, the highest readings were found in May and October—6.00 and 6.69 milligrams, respectively, and an average of 6.21 and 5.58. The readings for March were almost as high, but the midsummer months have such frequent rains during the hottest hours of the day that the highest reading seldom reached the intensity of those in the late spring and early fall. However, the number of hours during which the intensity of the rays exceeded the erythema dose were several more in the long summer days. These exposures were made between 12:30 p.m. and 1:30 p.m. since that hour was found by previous experiments to be the one hour where the actinic readings were most often the highest.

In the textile industry, according to Coke (*9*), all fibers used must have reasonably good resistance to degradation to the elements or they are not acceptable as textile fibers. The end use of the fiber determines the relative amount of resistance to degradation to sunlight which is necessary. He further states that all organic textile fibers, on continued exposure to sunlight, undergo increasing chemical and physical degradation, the rate varying with the nature of the fiber.

Testing Procedures

Selection of fabrics—Thirteen white fabrics, including four plain, one twill, and eight leno weaves, were selected for this experiment. The fiber contents of these fabrics were two acrylic fibers (Acrilan and Orlon)[1]; two di-acetates; two cottons; one acetylated cotton; one mercerized cotton; two polyesters (Dacron)[1]; one nylon; and two viscose rayons.

Natural exposure conditions—Open test racks were built so that test fabric samples were facing due south at a 45 degree angle and were placed at the Marine Biology Laboratory at Alligator Point on the Gulf Coast of Florida, which is about 40 miles from Tallahassee. The fabrics for weathering were exposed from April 1 to October 1 through the hot, sunshiny, but humid summer season. At the same time a duplicate set of fabrics were boxed and stored in an attic of a nearby building of the Marine Biology Laboratory.

In order to find the difference between the Gulf

[1] Trade name.

Coast exposure and inland exposure, the above series of tests were duplicated both indoors and outside at the University Farm, Tallahassee.

The second set of fabrics was exposed to outdoor weathering at the University Farm for three months in the spring (April, May, June) and in the fall (October, November, December).

Regular physical tests—The physical tests for the thickness, weight per square yard, thread count, and yarn twist were performed according to ASTM D39-49, the Standard General Methods of Testing Woven Fabrics. The bursting strength tests were performed on a Mullen bursting strength machine, according to the Standard Specifications for Textile Testing Machines D76-53. (*10*)

Results

Analysis of fabrics—An analysis of the fabrics, according to the physical tests, revealed results as shown in table 1.

The Acrilan acrylic twill woven fabric was the heaviest, 5.3 ounces per square yard. The plain woven fabrics followed, with one of the cottons, 3.8 ounces, the heaviest, the Dacron polyester plain woven fabric, 2.7, being the next heaviest. Acetate, 1.5 ounces, and the other cotton, 1.2, were considerably less in weight. Among the leno weaves, except for two of the cottons, 2.8 and 2.5, the others were all only 1½ ounces or less in weight per square yard.

The leno woven fabrics all had a yarn count per square inch of less than 100 except the Dacron polyester marquisette, which was close to it with 108. The plain and twill woven fabrics ranged from 130 to 225 yarns per square inch.

Ten of the thirteen fabrics had a thickness of less than one hundred ten thousandths of an inch. Two of the cottons were a little thicker, while the Acrilan acrylic twill fabric was more than twice as thick as most of the other fabrics (0.0217).

The yarn twist seemed to be without relation to fiber content or construction. The fabrics with an S twist in both warp and filling were the Acrilan acrylic twill woven fabric, the cotton leno woven slub fabric, and the two leno woven viscose fabrics. The others were all Z twist.

The amount of twist per inch ranged from 12.0 to 27.3 warp and filling for all except the twill woven Acrilan acrylic fabric, which had about 8 twists per inch in both warp and filling.

The bursting strength bore more relationship to fiber content than to fabric construction. The two acetate and the two viscose fabrics had the lowest bursting strengths, all between 44 and 50 pounds per square inch. The cottons came next, ranging from 62 to 90 pounds. The pure synthetics ranged from 92 to 220 pounds.

Natural Weathering

Six months from April 1 to October 1—The weathering tests were made at the coast and inland to see whether there was any appreciable difference in the rate of degradation. This was done by exposing a set at each location both indoors and outdoors for six months from April 1 to October 1.

TABLE 1

Physical properties of fabrics selected for weathering

TYPE FIBER	TYPE OF BASE FABRIC CONSTRUCTION	THICKNESS	WEIGHT	YARN COUNT			TWIST (Direction and Amount per Inch)		BURSTING STRENGTH
				Warp	Filling	Square In.	Warp	Filling	
		inches	*ounces per square yard*						*pounds per square inch*
*Acrilan Staple	Twill	0.0217	5.3	78	52	130	S 7.9	S 7.6	170
Acetate Filament	Plain	0.0068	1.5	82	73	155	Z 19.1	Z 27.3	50
Acetylated Cotton Staple	Plain	0.0128	3.8	80	58	138	Z 24.0	Z 23.7	85
Acetate Filament	Leno	0.0078	1.5	46	30	76	Z 17.4	Z 17.4	46
Cotton Staple	Plain	0.0088	1.2	72	68	140	Z 19.8	Z 20.7	90
Cotton Staple	Leno	0.0085	2.8	54	26	80	Z 12.6	Z 21.1	62
Cotton Staple Mercerized	Leno with slub	0.0110	2.5	46	26	72	S 15.9	S 16.0	68
*Dacron Filament	Leno	0.0060	1.1	58	50	108	Z 23.6	Z 26.5	92
*Dacron Filament	Plain	0.0050	2.7	135	90	225	Z 14.5	Z 10.8	220
Nylon Filament	Leno	0.0075	1.2	50	41	91	Z 19.6	Z 17.6	110
*Orlon Filament	Leno	0.0080	1.3	54	32	86	Z 16.9	Z 16.8	98
Viscose Filament	Leno	0.0075	1.5	54	30	84	S 15.6	S 12.0	44
Viscose Filament	Leno	0.0095	1.5	44	20	64	S 16.0	S 16.4	50

* Trade Names

Indoor exposure—According to table 2, the results seemed to be quite similar for the two sets exposed indoors in the dark whether at the coast or inland. The greatest loss in either location was about 15 per cent, which only happened in a few cases, and the majority showed little or no loss. The differences which occurred between the indoor exposure at the coast and inland seem to be within experimental error.

Outdoor exposure—The results of the outdoor weathering at the coast and inland were also similar. The amount of degradation, however, in the outdoor exposure was quite different from that taking place indoors. Four fabrics—plain acetate, acetylated cotton, and the two viscose fabrics—lost all their strength at both locations. The cotton marquisettes lost all or nearly all of their strength at both locations except for inland exposure of mercerized slub marquisette, which retained a third of its strength. The plain woven cotton also retained about one-third of its strength. Some of this retention of strength may be related to the construction of the fabrics as indicated by Whittaker (5).

Acrilan acrylic twill fabric had the highest retention at the end of the six months' period, 86 and 89 per cent, coast and inland, respectively. Orlon acrylic marquisette results were next with 69 and 67 per cent retained, coast and inland, respectively. Some of this difference is probably influenced by the difference in fabric construction. Nylon behaved differently at the two places with a retention of 59 per cent at the coast and only 14 per cent inland at the end of the six months.

Three months each spring and fall—Orlon acrylic marquisette retained almost three quarters of its strength in both spring and fall exposure.

All fabrics showed greater degradation in the spring (April, May, and June) than in the fall (October, November, and December). But Orlon acrylic marquisette showed the least difference—only 3 per cent. On the other hand, viscose and acetate were totally lost in the spring. The remaining fabrics also greatly degraded, retaining only 14 to 41 per cent of their original strength in the spring.

In the fall testing, no fabric was completely degraded; but these same viscose and acetate fabrics retained the least strength, only a fourth or less. Two other fabrics retained only a third of their strength, namely cotton marquisette and Dacron polyester marquisette. The remaining fabrics retained approximately half of their strength except for the Orlon acrylic marquisette mentioned above, which was 73 per cent.

Summary

The fabrics were tested under outdoor exposure and indoor storage conditions on the Gulf Coast and 40 miles inland for six months, April to September, inclusive.

From this testing there seemed to be little difference between storage conditions at the coast and 40 miles

TABLE 2

Per cent of retained bursting strength of thirteen curtain fabrics after exposure to natural weathering

TYPE FABRIC	ORIGINAL BURSTING STRENGTH	BURSTING STRENGTH RETAINED					
		Six Months April to October				Spring	Fall
		Indoor		Outdoor		Apr. May June	Oct. Nov. Dec.
		Coast	Inland	Coast	Inland	Outdoor-Inland	Outdoor-Inland
	pounds	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
*Acrilan, Twill	170	102	101	86	89	—	—
Acetate, Plain	50	104	92	0	0	—	—
Acetate, Leno	50	—	—	—	—	2	18
Cotton, Acetylated, Plain	85	106	101	0	0	—	—
Cotton, Leno	62	84	85	0	8	14	34
Cotton, Plain	90	83	89	20	36	—	—
Cotton, Mercerized, Leno, Slub	68	106	104	0	32	41	47
*Dacron, Leno	92	—	—	—	—	†	32
*Dacron, Pile	220	—	—	—	—	30	50
Nylon, Leno	110	100	94	59	14	41	48
*Orlon, Leno	98	92	84	69	67	70	73
Viscose, Leno	44	111	105	0	0	0	25
Viscose, Leno	50	108	102	0	0	—	—

* Trade Names
† No fabric available in the Spring

inland. Six of the 10 fabrics showed no loss in strength. The remaining 4 showed some loss, but this may have been within experimental error.

On outdoor exposure, again there was no appreciable difference between the coastal and inland exposure, with the exception of the mercerized cotton marquisette and nylon marquisette fabrics.

Only the two acrylic fibers, Acrilan twill woven fabric and the Orlon marquisette, retained an appreciable strength at the coast and inland for outdoor exposure.

During the three months of spring and fall exposures, again the acrylic fiber, Orlon marquisette, was the only fabric which retained more than half of its original strength. Dacron polyester, nylon, and mercerized cotton showed rather similar results but less than half of their original strength was retained.

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Opportunities for Graduate Assistantships, Fellowships, and Scholarships, 1958-59 and 1959-60

Open to Graduates in Home Economics

The following additions and changes apply to the list of graduate opportunities published in the Journal of Home Economics for February 1958.

Reprints of the list are available without charge on individual request from the American Home Economics Association, 1600 Twentieth St., N.W., Washington 9, D. C.

Merrill-Palmer School	—Winifred Rand Fellowship for 1959-60, for graduate study of human development and family life. Stipend of $1,000 with tuition fees waived. Make early application to The Registrar, The Merrill-Palmer School, 71 East Ferry Avenue, Detroit 2, Michigan.
Michigan State University	—Change five assistantships listed as CD to HM and CD (home management and child development)
University of Minnesota	—Stipend for a half-time assistantship increased to $1890.
New Mexico State University (Formerly New Mexico College of A and M)	—Graduate assistantship in institution administration no longer offered. Add one graduate assistantship in food and nutrition research. Requires approximately 22 hours per week spent in assisting in Experiment Station Research in Home Economics. Stipend, $2,076 per 12 months. Student pays own enrollment fees.
Woman's College of the University of North Carolina	—Add one home economics foundation research assistantship in child development. Stipend and responsibilities same as listed for previous opportunities.
University of Rhode Island	—Increase stipend for graduate assistant to $1600 for academic year.
University of Wisconsin	—Increase amount of stipends for assistantships to $1650 and $1980.

The insulative qualities of blankets of some of the newer man-made fibers and the means of measuring their insulative quality form the basis for this study of interest to both homemakers and manufacturers.

Measuring Insulative Value of Blankets of Wool and Man-made Fibers

Ann Fahnestock and Evelyn E. Stout

Dr. Stout is an associate professor of textiles and clothing at the New York State College of Home Economics, a Unit of the State University of New York, at Cornell University. Mrs. Fahnestock, a former instructor in the department of textiles and clothing, is now working on her PhD degree at Cornell University. The work of the project reported here was carried on by Mrs. Fahnestock under Dr. Stout's direction.

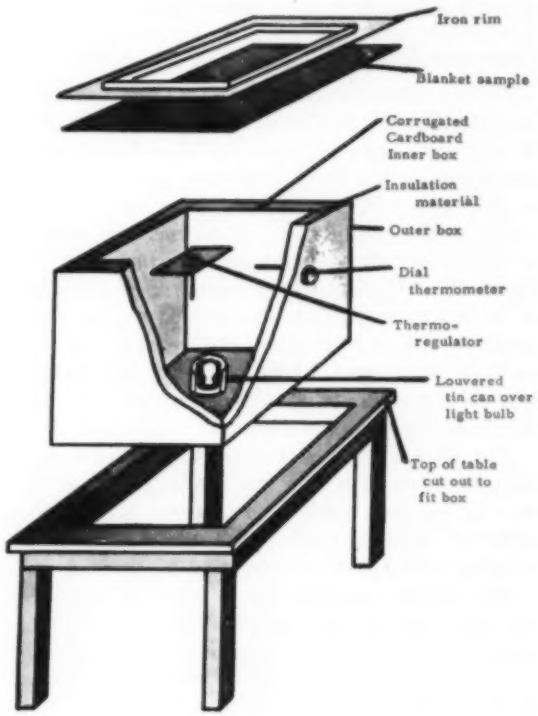
IN recent years, several man-made fibers have appeared in blankets in this country. They have been so well received that some stores have ceased to stock traditional wool blankets. Consumers know, in general, that the method of cleaning and care greatly affect the serviceability of wool blankets. But they have had little opportunity as yet to know how such treatments may affect the man-made fiber blankets.

The purposes of this study were (1) to develop methods for measuring insulative quality and thickness of blankets without compression of the blanket surface, (2) to compare the insulative quality of blankets of different fibers when cleaned by different methods, and (3) to compare results of the method with reactions of the users of the blankets.

Apparatus Devised

A blanket-testing box was devised by the senior author in collaboration with an agricultural engineer. The latter built the box and helped to determine a procedure for its use. The thickness device and its use were devised by the junior author. Both pieces of apparatus functioned successfully with no compression of the blanket surface.

The testing box (see the figure) was an "unguarded" hot box, designed for use in a humidity-and-temperature-controlled laboratory. It was so designed as to maintain a constant inside air temperature when its open top was covered by a lid of the identical construction as the box or by the blanket specimen. The apparatus was essentially a double cardboard box measuring 23 x 23 x 23 inches (outside dimensions) with a 2½-inch space between the boxes, which was filled with vermiculite insulation material and with the inner box lined with aluminum foil. It was mounted in an opening cut into a low table so that the box was exposed to the room atmosphere as equally as possible on all sides. A light wire rack fitted into the top of the box to give support to the blanket sample. A weighted angle-iron frame was fitted to the top



TESTING BOX DESIGNED FOR USE IN MEASURING INSULATIVE PROPERTY OF BLANKETS

edge of the outer box in order to hold the blanket specimen in close contact with the box edge. The box was equipped with thermostat, watt meter, and thermometers, and was maintained at a constant inside temperature (97°F) by means of a 25-watt light bulb placed in the floor of the box and covered with a louvered metal can to insure even distribution of heat.

The amount of heat needed to maintain the box, with cover in place, at the specified constant temperature was determined in order to calculate the amount of heat loss through the box alone. Blanket specimens were conditioned on the box at least 5 hours before the first readings were made, then were left on the box overnight so that each test covered a period of at least 10 hours.

The device for thickness measurement was a small engineering ruler, with 0.02-inch divisions, mounted against a support so that the zero mark of the ruler coincided with the horizontal surface of a small platform on which the sample was placed for measurement. The device was used with the platform at eye level to eliminate parallax. A square marker held against the scale by means of a rubber band was lowered to the nap of the blanket until its lower edge could be "just seen." Measurements were made on sets of 2- x 2-inch samples.

Procedure

Twelve blankets—three each of 100 per cent Acrilan, 100 per cent Orlon, 100 per cent wool, and 90 per cent rayon–10 per cent Orlon blend—were purchased on the retail market at prices from $9 to $14 each in October 1957. The new blankets were tested for insulative quality, thickness, weight in ounces per square yard, and bursting strength. Dimensional change was measured on the washed or dry-cleaned blankets in addition to the tests made on the new blankets. ASTM standard test methods were used where available, and testing was carried on under standard conditions of relative humidity and temperature.

Two blankets of each fiber were divided into sections for a series of five dry cleanings, five washings by the soak method, or five washings by the agitation wash method. After each cleaning or washing, a specimen was removed for testing.

Dry cleaning was done commercially by a method recommended by the co-operating firm for light cleaning of blankets and, reportedly, with no pressing. An automatic agitator-type washer with a spin cycle to remove water was used for washing.

The soak-wash method was adapted from the recommendations made in an Ohio Farm and Home Research Bulletin[1] as follows: the washer controls were set for slow spin speed and normal water level. Warm water (97° to 99°F), softener (to bring hardness to zero), and a built synthetic detergent were added; and the machine was operated until these were dissolved. With the machine stopped, the blanket was placed in the suds and allowed to soak for 15 minutes. The suds were then removed by spinning and the washer refilled for rinsing. Again the machine was stopped and the blanket allowed to stand in the water for 5 minutes, then extracted by a spinning. The rinse and spin were repeated. The blanket was placed on a rack indoors to dry. The washing procedure took 40 minutes per blanket.

The 4-minute agitation-wash method was as follows: the washer and suds were prepared exactly as for the soak method. After the blanket was placed in the suds, the dial was set for a 4-minute agitation-wash period. This was followed by the normal spin to extract the suds, a spray rinse, a deep rinse with agitation, and the final water extraction. The blanket was dried on a rack indoors. This washing took 23 minutes per blanket.

All labels were removed from the third set of new blankets and each was used during two different blocks of time by each of four carefully chosen volunteers living in a graduate women's dormitory. Each girl kept daily night and morning records of her room temperature, anything that might affect how she slept, and the number of other blankets, all of which were identical, that she had used atop the test blanket. The students were interviewed at the end of each time span in which they had used all four blankets in an attempt to ascertain their reaction to several properties of the blankets.

Findings and Discussion

The Hotel Textile Purchasing Guide (incorporating American Standard L-24) by Bradley specifies a maximum shrinkage for woven blankets of 8 per cent in laundering or of 2 per cent in dry cleaning (assumed to mean warp plus filling shrinkage). By these standards, the performance of the Acrilan and Orlon blankets was satisfactory with all methods of cleaning, the rayon-Orlon with dry cleaning, and the wool with none. See table 1.

Thickness and weight increased with shrinkage except for the Orlon, which, although it changed little dimensionally, became thinner and lighter

[1] E. K. Weaver, M. A. Plonk, and M. F. Bordt. Manual Control of Automatic Washers Is Necessary When Laundering Blankets. Ohio Agr. Expt. Sta. Farm & Home Research Bull. No. 279 (Nov. 1952).

TABLE I

Dimensional changes of blankets compared to controls*

METHOD	PER CENT CHANGE							
	Acrilan		Rayon-Orlon Blend		Orlon		Wool	
	Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling
Soak wash								
1 time	+0.7	+0.8	−5.6	−2.5	+0.2	+0.1	−3.4	−6.8
2 times	0.0	+0.6	−6.5	−1.9	−0.9	+0.6	−4.7	−6.5
3 times	+0.4	+0.6	−3.9	−1.7	+0.2	+0.2	−5.2	+5.3
4 times	+0.7	+0.4	−6.6	+0.1	−0.8	+0.4	−3.9	−6.0
5 times	−0.5	+0.4	−5.3	−1.1	+0.2	+0.8	−4.3	−6.3
Four-minute agitation wash								
1 time	+0.6	−0.1	−6.9	−2.4	—	—	−7.2	−7.6
2 times	+0.5	+0.4	−6.2	−0.3	−0.1	+0.5	−6.7	−7.3
3 times	+1.0	+0.6	−7.4	−0.7	−1.1	+0.8	−8.1	−7.3
4 times	+0.8	+1.1	−9.4	+0.6	−1.4	+1.1	−9.3	−7.5
5 times	0.0	+0.6	−5.2	−1.5	−1.5	+0.4	−9.0	−9.1
Dry cleaning								
1 time	−1.0	−2.0	+1.3	+0.6	−2.0	−0.3	−1.3	−2.2
2 times	−1.6	−1.1	−0.3	+0.8	−2.9	+4.5	−2.2	−1.3
3 times	−1.7	−1.0	−0.5	+0.2	−0.6	+2.1	−2.9	−1.3
4 times	−1.1	−0.8	+0.4	+0.8	+0.2	+2.9	−2.4	−2.4
5 times	−1.7	+0.7	+0.7	+1.5	−1.1	+5.1	−2.8	+0.1

* + = Stretch; − = Shrinkage

in weight, indicating a loss of fiber. Strength of all blankets was considered satisfactory. Thickness (in inches) of the new blankets was as follows: Acrilan 0.318, wool 0.294, Orlon 0.254, and rayon-Orlon 0.246. Weight (in ounces per square yard) was: rayon-Orlon 11.10, wool 11.07, Acrilan 11.03, and Orlon 9.13.

Watts per hour to maintain constant temperature in the box when covered with the new blanket specimens were: for Acrilan 8.96, for rayon-Orlon 9.32, for Orlon 9.59, and for wool 9.93. Changes in the watt hour rate are inversely related to changes in insulative quality; that is, the fewer watts per hour needed to maintain a constant temperature, the better the insulative quality of the blanket. Thus, of the new blankets, the Acrilan was thickest and the best insulator and of about the same weight as the wool and rayon-Orlon.

The blankets performed quite differently, however, with the different cleaning methods; and in this study, insulative value could not consistently be said to be directly proportional to thickness. Charts 1, 2, and 3 show the relationships between weight, thickness, and insulative quality for the different blankets at the various cleaning or washing intervals and at the end of the study.

Since the blankets varied in thickness, in order to compare insulative quality, the watts per hour must be based on the same blanket thickness. The data have been so converted in table 2. The same interpretation holds as before—the lower the figure, the better insulator the blanket, assuming that change with thickness is a straight-line change. These figures suggest that the Acrilan blanket was the best insulator, the wool next, and Orlon last.

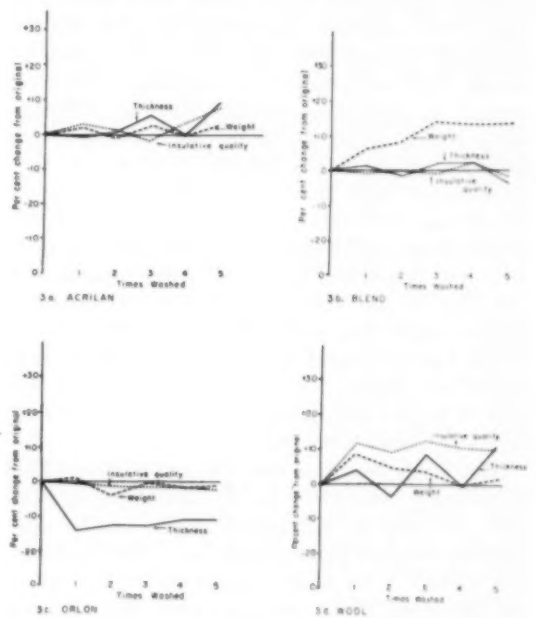


CHART 1. Per cent change in weight, thickness, and insulative quality of blankets after soak washing

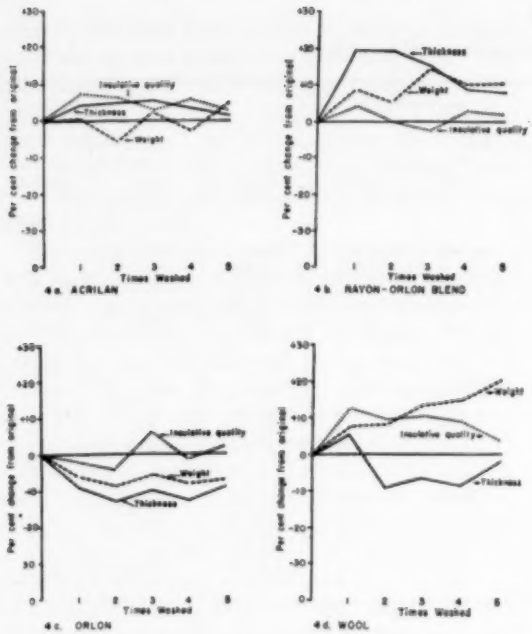


CHART 2. Per cent change in weight, thickness, and insulative quality of blankets after 4-minute agitation washing

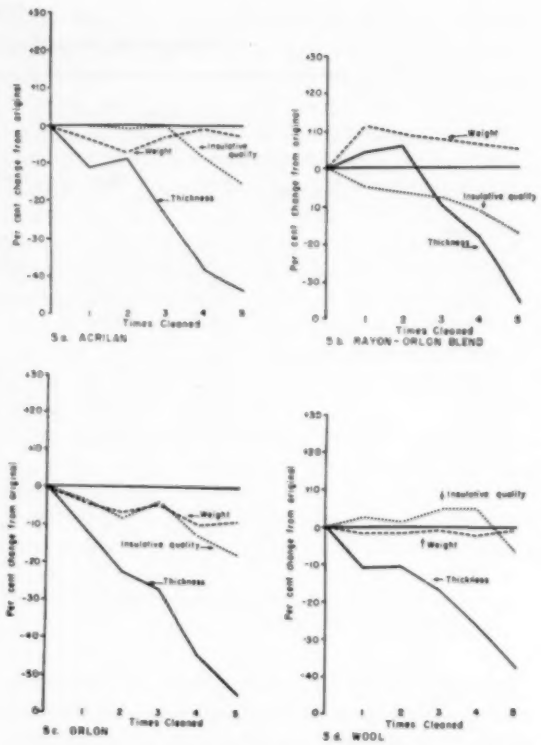


CHART 3. Per cent change in weight, thickness, and insulative quality of blankets after dry cleaning

Use Study and Cleansing

Since there were so few users in this study, few conclusions can be drawn from their interviews and records. At the end of the study, three of the four users were unable to say which blanket was the warmest, although they accurately ranked them for weight and some other characteristics. The users tended to prefer the Acrilan blanket. Although users could not assign a warmth ranking to the blankets, study of the records showed that they consistently used fewer other blankets with the Orlon than with other test blankets except on the coldest nights when they used all the other blankets they had (same number for all girls) regardless of the kind of test blanket. The data on insulative quality would not lead to the expectation that the Orlon blanket would be warmest. In addition to insulative quality, the softness of a blanket and how it drapes around the sleeper need to be evaluated as factors in warmth.

This study indicates that the soak-wash method is probably satisfactory for all these types of blankets, and that the Acrilan and Orlon can be satisfactorily washed by either method. The dry cleaning method used is not recommended for any of the blankets. Much more extensive and intensive testing needs to be done with blankets of the various fibers.

TABLE 2

Watts per hour based on same thickness of blankets

CLEANING METHOD AND TIMES	ACRILAN	RAYON-ORLON BLEND	ORLON	WOOL
	watts	*watts*	*watts*	*watts*
Control	28.2	37.9	37.8	33.8
Soak wash				
1 time	27.6	37.5	44.4	28.6
2 times	27.6	38.6	43.9	31.8
3 times	27.2	37.3	44.0	27.3
4 times	27.2	36.9	43.3	29.9
5 times	23.7	39.9	43.5	27.4
Four-minute agitation wash				
1 time	25.0	30.4	42.8	27.9
2 times	25.2	31.7	45.7	33.9
3 times	26.0	33.6	39.6	32.5
4 times	25.8	34.0	44.4	33.8
5 times	26.7	34.5	41.0	33.4
Dry cleaning				
1 time	31.7	37.9	44.1	37.0
2 times	31.1	37.9	53.3	37.1
3 times	36.8	45.3	54.3	39.0
4 times	49.6	51.7	79.1	48.2
5 times	58.2	68.6	99.7	57.6

Whiteness retention of a fabric and the ease with which soil can be removed from it are important factors in detergency. The effect of selected soaps and detergents upon these properties of widely used fabrics of two fiber compositions is the subject of this report.

Comparison of Two Washability Characteristics of Dacron-and-Cotton Fabrics with Those of Similar All-Cotton Fabrics[1]

Pauline E. Keeney, Frances Buchanan, Alice Jackson, and Jane Edwards

Dr. Keeney is a professor of textiles and clothing, Mrs. Buchanan is a research assistant in textiles, and Miss Jackson is an instructor in clothing and textiles at the Woman's College, University of North Carolina. Miss Edwards is assistant home demonstration agent in Nash County, North Carolina. The junior authors aided in this study while working for advanced degrees in home economics.

IN our modern age, with its emphasis on time-saving methods, devices, and fabrics requiring little care, Dacron is being accepted by the consumer as a fiber well suited to the easy-to-care-for fabric needed for apparel. The well-known qualities of cotton blend with those of Dacron to form many fabrics with consumer appeal in a wide variety of textures. One of the best sellers on the fabric market today is a blend of 65 per cent Dacron and 35 per cent cotton, which is being used in men's dress and sports shirts, ladies' dresses and blouses, and is expected to gain greater prominence in the sportswear and suiting fields. In blends of this type, it is possible to combine the comfort and good looks of cotton with the long-wearing strength and easy maintenance qualities of Dacron (*1*).

There is also consumer appeal in those properties which extend the serviceability of the fabric—particularly to those properties which contribute to their use in wash-and-wear apparel. Dacron-and-cotton and all-cotton fabrics look the same, and it is only after several wearings and launderings that the super performance of the Dacron-and-cotton blend is definitely established (*1*). Studies have indicated that the Dacron-and-cotton blends offer excellent long-term value in looks, performance, and minimum care (*2*). Other studies comparing the performance features of these blended fabrics with those of similar all-cotton fabrics indicate differences in the appearance of the fabrics after laundering (*3*), in the affinity for soil, and in the relative ease and effectiveness of cleaning the fabrics (*4*). There is little information pertaining to specific differences in the retention of fabric whiteness or the removal of soil during laundering. Differences in physical properties of cotton and Dacron may contribute to the behavior of the fabrics in the retention of fabric whiteness and in the removal of soil during laundering.

Cotton, being a hydroscopic fiber, is noted for its response to moisture. It absorbs and releases large quantities of water. Dacron, by contrast, is a hydrophobic fiber which does not absorb or release quantities of water.

The union of hydrophylic and hydrophobic fibers is known to produce in fabrics of Dacron-and-cotton blend problems in regard to soiling and the effectiveness of soil removal. According to one authority, it is believed that any soil which is deposited on hydrophobic fibers—which do not swell in water or dye readily—must remain on the surface. It is also thought that hydrophobic fibers may resist soiling more than do the hydrophylic fibers (*5*). The need for more factual information on the possibility of such differences between fabrics of hydrophobic fibers and those of hydrophylic fibers is acknowledged.

This research, undertaken partly in response to this need, studied the effects of laundering upon the whiteness of, and soil removal from, Dacron-and-cotton blends compared with similar all-cotton fabrics. Selected soaps and synthetic detergents, popular in home laundering, and soft water were used.

[1] Contribution from the home economics department, North Carolina Agricultural Experiment Station, Raleigh, North Carolina. Published with the approval of the director of research as Paper No. 955 of the Journal series.

Procedure

Three white shirt fabrics of 65 per cent Dacron and 35 per cent cotton and three all-cotton fabrics of similar construction were selected. Swatches of each of the six fabrics were laundered with four soaps and four synthetic detergents popular for home laundering use. An L-2-Q Launder-Ometer equipped with ½-gallon jars containing 50 mm of water and 0.5 gram of the detergent being tested was used. The temperature was kept at 105° Fahrenheit. Swatches of each fabric, approximately 10 x 12 inches, were laundered for 30 minutes, rinsed by hand, and allowed to drip dry. After drying, they were pressed lightly on the wrong side to avoid producing a gloss on the right side of the fabric.

A Hunter Multipurpose Reflectometer was used to measure the light reflectance of the swatches before laundering and after the first, second, fifth, tenth, twentieth, thirty-fifth, and fiftieth launderings. The reflectance values of the green, amber, and blue filters were averaged to indicate the per cent reflectance. Changes in the whiteness retention properties of the fabric at each testing period were calculated by using the following formula (*6*):

$$\text{Whiteness Retention} = \frac{\text{Reflectance after washing}}{\text{Reflectance unwashed fabric}}$$

Similar swatches of the same fabric were treated with a standard soil solution. The Hunter Multipurpose Reflectometer was used to determine the per cent reflectance after the first, second, fifth, tenth, twentieth, thirty-fifth, and fiftieth launderings. These reflectance values, when used in the following formula, indicate the per cent soil removal:

$$(A - B) \div (C - B) \times 100 = \%\ \text{Soil Removal}$$

where A = soiled fabric after wash, B = soiled fabric before wash, and C = white fabric before soiling (*6*)

Student's "t" method (*6*) of comparing two means was used to determine the significance, at the 95 per cent confidence limit, of the differences in the effectiveness of the detergents on the two types of fabrics in both retention of original whiteness and in the effectiveness of soil removal.

Results

The laboratory analysis of fabric construction is shown in table 1. Although the fabrics were selected because of apparent similarity in construction, the two Oxford cloth fabrics were more closely comparable to each other than were either of the batiste fabrics. The Dacron-and-cotton Oxford cloth XO-4 was similar to the all-cotton Oxford cloth O-3 in thickness, weight, thread count, yarn number, and filling twist count. Except for the close similarity in staple length of the all-cotton batiste B-1 to both Dacron-and-cotton batiste fabrics and in the twist count of XB-8 and B-2, there was little similarity between the Dacron-and-cotton batiste fabrics and the all-cotton batiste fabrics.

The four soaps and four synthetic detergents used were selected from popular household soaps and detergents. The description of these products is given in table 2. Two of the products in each group were considered appropriate for light-duty laundering and two for heavy-duty laundering.

The reflectance values of the original white fabrics revealed differences in the whiteness of the fabrics of different fiber content. Although the all-cotton Oxford cloth was visibly the whitest of all

TABLE 1

Laboratory analysis of fabric construction

FIBER NUMBER	FIBER CONTENT		WEAVE	WIDTH	THICKNESS	WEIGHT	THREAD COUNT		YARN NUMBER		STAPLE LENGTH		TWIST COUNT		REFLECTANCE
	Dacron	Cotton					Warp	Filling	Warp	Filling	Warp	Filling	Warp	Filling	
	per cent	*per cent*		*inches*	*inches*	*oz/sq yd*					*inches*	*inches*			*per cent*
All-cotton															
B-1	—	100	Plain	38	0.004	1.4	114	108	93.8	135.8	1.6	1.5	32Z	32Z	83.5
B-2	—	100	Plain	40	0.005	1.9	96	98	62.6	80.8	1.2	1.3	26Z	32Z	85.5
O-3	—	100	2 x 1 Basket	38	0.023	4.0	94	45	42.2	13.5	1.3	1.1	20Z	11Z	85.0
Dacron-and-cotton															
XB-6	69.3	30.7	Plain	45	0.008	2.4	91	79	49.0	56.0	1.6	1.6	29Z	28Z	76.1
XB-8	68.7	31.3	Plain	46	0.008	2.9	103	98	46.0	60.0	1.6	1.6	26Z	33Z	78.6
XO-4	68.9	31.3	2 x 1 Basket	45	0.021	4.4	94	46	39.9	12.1	1.5	1.7	26Z	14Z	76.8

TABLE 2

Description of the detergents used

CHEMICAL NATURE	TYPE	pH	BRIGHTENER*	BUILDER*
SYNTHETIC DETERGENTS				
a Alkyl aryl sulfonate	Light duty—Anionic	6.9		
b Alkyl aryl sulfonate	Heavy duty—Anionic	9.1	x	x (light)
c Alkyl sulfate	Light duty—Anionic	9.3	x	x
d Alkyl aryl sulfonate and alkyl sulfate	Heavy duty—Anionic	9.2	x	x
SOAPS				
A	Light duty	9.7	x	
B	Light duty	9.6		
C	Heavy duty	9.4	x	x
D	Heavy duty	9.4	x	x

* x indicates presence of brightener and builder

fabrics, there was little difference in the reflectance values of this fabric and the two batiste fabrics of all-cotton content. All three of the Dacron-and-cotton fabrics were of lower per cent reflectance than the three all-cotton fabrics. In the Dacron-and-cotton group, fabric XB-8 had a slightly higher reflectance value than had the other two fabric blends, XB-6 and XO-4.

Differences were noticed in the soiling tendencies of the fabrics of the two types of fibers. The three Dacron-and-cotton fabrics soiled more readily than did the all-cotton fabrics. They also appeared to be more heavily soiled but, since the original Dacron-and-cotton fabrics were darker than the all-cotton fabrics, there was little actual difference in the amount of soil deposited on the two types of fabric. The all-cotton Oxford cloth O-3 was more resistant to soil than were the other fabrics in spite of fabric thickness and softness of the fabric construction.

TABLE 3

Per cent of whiteness retention of fabrics laundered with synthetic detergents and soaps

FABRIC NUMBER	SYNDET	WITH SYNTHETIC DETERGENTS — Times Laundered							SOAP	WITH SOAPS — Times Laundered						
		1	2	5	10	20	35	50		1	2	5	10	20	35	50
		%	%	%	%	%	%	%		%	%	%	%	%	%	%
ALL-COTTON FABRICS																
B-1	a	95.9	97.1	97.1	96.8	95.5	95.2	95.6	A	95.0	96.0	93.0	95.0	96.0	97.0	96.0
	b	93.9	94.3	96.8	96.5	95.5	95.8	96.2	B	95.0	94.0	95.0	96.0	93.0	96.0	96.0
	c	95.7	93.2	97.1	96.4	96.5	97.2	96.3	C	93.0	94.0	93.0	96.0	96.0	96.0	97.0
	d	93.9	94.3	96.2	100.0	98.0	98.3	97.8	D	96.0	93.0	96.0	96.0	94.0	95.0	96.6
B-2	a	94.6	92.4	95.8	95.3	94.0	94.3	94.5	A	94.0	95.0	93.0	94.0	95.0	94.0	95.0
	b	95.9	93.5	94.1	94.4	95.2	96.0	95.4	B	93.0	94.0	93.0	93.0	93.0	94.0	96.0
	c	92.2	93.0	93.6	93.5	95.3	95.4	96.3	C	94.0	94.0	93.0	94.0	93.0	95.0	96.2
	d	95.2	92.5	94.2	95.2	96.1	95.9	96.0	D	94.0	95.0	94.0	95.0	94.0	96.0	95.6
O-3	a	100.1	100.0	99.1	101.5	100.1	100.8	101.5	A	102.0	102.0	101.0	100.0	103.0	102.0	103.0
	b	100.6	101.3	100.5	102.8	99.9	102.3	103.4	B	100.0	102.0	102.0	101.0	99.0	102.0	102.0
	c	99.2	99.2	97.6	96.5	97.5	98.4	99.6	C	101.0	101.0	100.0	101.0	100.0	102.0	103.6
	d	100.9	99.9	98.3	97.3	97.2	102.4	100.9	D	101.0	102.0	102.0	102.0	101.0	101.0	103.2
DACRON-AND-COTTON FABRICS																
XB-6	a	98.8	96.6	96.7	97.1	98.0	95.7	96.7	A	96.0	97.0	97.0	98.0	99.0	99.0	101.5
	b	101.9	97.3	98.7	99.2	99.1	99.7	100.5	B	96.0	97.0	97.0	99.0	97.0	99.0	101.3
	c	96.3	96.7	96.3	96.8	98.8	98.8	99.3	C	98.0	99.0	99.0	98.0	99.0	100.0	102.3
	d	97.6	97.2	97.3	97.6	100.0	99.9	100.4	D	98.0	97.0	99.0	99.0	97.0	97.0	101.3
XB-8	a	99.5	97.3	98.1	98.9	98.3	96.2	98.4	A	100.0	100.0	100.0	100.0	101.0	99.0	102.2
	b	99.7	97.1	100.1	99.9	99.2	99.4	99.1	B	100.0	99.0	100.0	101.0	101.0	102.0	102.2
	c	99.3	98.9	99.1	99.4	102.2	100.7	101.0	C	101.0	100.0	100.0	100.0	101.0	101.0	102.9
	d	101.3	99.3	99.4	99.2	101.7	101.2	101.1	D	100.0	101.0	101.0	101.0	100.0	102.0	102.5
XO-4	a	103.2	101.8	101.7	101.9	101.9	104.1	104.2	A	103.0	104.0	104.0	104.0	106.0	106.0	107.6
	b	102.3	103.3	104.4	104.3	103.2	107.9	107.1	B	103.0	104.0	105.0	105.0	104.0	106.0	107.6
	c	101.7	102.6	100.7	102.3	101.4	105.6	107.4	C	103.0	105.0	104.0	106.0	103.0	106.0	108.9
	d	103.6	104.8	102.6	103.6	103.6	101.5	104.7	D	101.0	104.0	104.0	105.0	106.0	106.0	107.6
				"t" = 3.8								"t" = 3.4				

"t" at 95 per cent level of significance = 2.07

Whiteness retention. Data pertaining to the effect of soaps and synthetic detergents upon the whiteness of the fabrics are presented in table 3. The greatest differences were the increased whiteness of the Oxford cloth fabrics of both Dacron-and-cotton and the all-cotton content when laundered with both soaps and synthetic detergents. The Dacron-and-cotton fabric XO-4 was slightly whiter than the all-cotton fabric O-3.

The all-cotton fabrics B-1 and B-2 each had lower per cent whiteness than the original fabric at each laundering period. This difference could be attributed to the loss of luster and sizing. The Dacron-and-cotton fabrics XB-6 and XB-8 were more varied in whiteness, ranging from decreased whiteness to slight increases in the per cent whiteness at the testing periods near the conclusion of the study.

It seemed to make little difference whether the synthetic detergent or the soap used was considered light duty or heavy duty. The addition of brighteners or builders had little effect on the whiteness of either the all-cotton fabrics or the Dacron-and-cotton fabrics.

Although the differences that were noted were extremely slight, the soaps were more effective on the Dacron-and-cotton fabrics and the synthetic detergents more effective on the all-cotton fabrics.

Soil removal. The effect of the soaps and synthetic detergents on the per cent soil removed from each fabric is shown in table 4. Differences were noticed in the effectiveness of the individual soaps and synthetic detergents upon each of the six fabrics being tested. The per cent soil removed from each of the fabrics increased progressively at each of the testing periods. Detergent D appeared to be the most effective of the four detergents used. While it was effective on fabrics of each fiber type, the Dacron-and-cotton fabrics were affected more than were those of all-cotton. The maximum soil

TABLE 4

Per cent of soil removed from fabrics laundered with synthetic detergents and soaps

FABRIC NUMBER	SYNDET	WITH SYNTHETIC DETERGENTS							SOAP	WITH SOAP						
		Times Laundered								Times Laundered						
		1	2	5	10	20	35	50		1	2	5	10	20	35	50
		%	%	%	%	%	%	%		%	%	%	%	%	%	%
ALL-COTTON FABRICS																
B-1	a	1.5	1.7	2.3	5.7	9.8	12.1	12.5	A	5.4	6.9	23.2	38.1	46.5	53.8	58.2
	b	4.0	4.7	13.2	15.4	21.4	26.0	32.6	B	4.0	8.5	27.4	42.2	54.4	66.4	68.3
	c	5.1	4.9	7.0	11.8	19.1	24.9	26.7	C	12.3	15.5	25.7	46.2	64.4	65.7	70.8
	d	8.8	10.9	20.8	25.0	28.5	31.9	38.9	D	5.1	4.2	22.3	48.4	62.9	69.9	71.0
B-2	a	7.6	8.3	11.6	13.4	15.1	16.6	17.1	A	11.2	17.6	30.1	37.3	42.9	48.3	50.7
	b	3.1	6.9	10.1	11.3	12.7	18.1	22.6	B	9.7	22.5	31.4	41.7	49.8	55.4	58.0
	c	2.8	6.6	7.9	12.0	18.6	20.0	20.8	C	15.5	15.7	28.9	46.3	52.8	55.9	60.8
	d	4.0	6.3	11.3	14.6	18.0	22.5	25.9	D	11.8	13.4	23.7	46.6	50.8	58.3	58.7
O-3	a	3.2	3.9	6.5	10.9	12.5	15.2	14.9	A	0.7	5.7	15.7	33.7	52.0	61.4	64.9
	b	0.2	6.7	11.1	13.5	16.3	21.3	25.1	B	3.8	10.5	23.1	41.7	57.2	71.0	73.5
	c	5.6	7.8	12.0	15.9	21.3	23.3	25.3	C	11.7	16.4	17.5	41.5	56.4	62.5	68.6
	d	6.1	8.7	15.4	18.4	24.6	27.8	32.9	D	4.5	5.1	18.2	35.6	44.3	57.9	63.5
DACRON-AND-COTTON FABRICS																
XB-6	a	2.2	5.9	14.6	19.1	24.5	28.4	28.5	A	9.2	20.7	38.6	47.1	54.3	58.1	64.5
	b	3.4	6.4	15.3	16.9	19.9	25.0	29.9	B	12.5	21.8	38.0	49.3	58.4	62.4	66.4
	c	7.3	10.0	12.4	16.3	22.1	27.8	29.7	C	4.1	17.2	30.2	43.0	49.9	57.4	62.0
	d	16.2	18.7	23.9	26.8	31.7	37.5	46.1	D	3.3	4.1	16.6	36.6	47.1	52.6	56.2
XB-8	a	1.8	3.0	8.1	12.4	18.6	21.1	20.7	A	10.6	14.2	22.2	28.6	35.0	39.9	44.8
	b	1.0	8.5	11.9	12.7	15.6	18.5	23.5	B	7.9	11.4	20.8	27.4	35.0	38.9	41.5
	c	8.2	10.0	11.2	13.3	15.4	20.4	22.3	C	0.7	6.7	18.8	23.9	32.6	39.5	42.4
	d	7.8	11.6	16.0	19.1	22.0	26.6	31.6	D	3.3	5.9	18.6	27.3	33.8	40.0	41.5
XO-4	a	3.1	4.7	7.4	15.3	16.9	20.0	20.5	A	3.7	10.4	26.4	45.7	57.5	62.9	68.7
	b	7.3	7.5	13.0	17.3	21.9	24.6	28.1	B	5.0	20.8	40.5	54.8	65.2	69.0	72.0
	c	2.6	8.3	11.2	13.9	19.2	25.6	27.3	C	11.0	21.9	32.9	41.2	54.9	61.8	66.4
	d	11.3	12.9	20.5	24.7	33.6	37.5	42.3	D	3.2	13.9	27.4	46.8	59.0	67.3	69.4
				"t" = 1.51								"t" = 1.44				

"t" at 95 per cent level of significance = 2.07

removal of this group was the 46.1 per cent removal from a swatch of XB-6 which had been laundered fifty times in Detergent D.

The soaps were more effective in removing soil from the six fabrics than were the synthetic detergents. The differences were visible as early as the first laundering period. By the time the fabrics had been laundered five to ten times, the soil removal from each fabric was similar to that from fabrics laundered with the detergents at the fiftieth laundering period. No one soap seemed to be consistently more effective in removing the soil.

Fabric XA-8 was more resistant to cleansing with either soaps or synthetic detergents than were the other five fabrics.

Although cleansing caused little change in the whiteness retention of either type of fabric, the synthetic detergents were slightly more effective on the all-cotton fabrics than on the Dacron-and-cotton fabrics while the soaps were more effective on the Dacron-and-cotton fabrics. It made little difference whether additives such as builders or brighteners had been incorporated into the soap or the synthetic detergent used.

The synthetic detergents were slightly more effective in removing the soil from the Dacron-and-cotton fabrics than from the all-cotton fabrics. Soaps, however, were undoubtedly more effective in removing the soil used from both types of fabrics. There was little difference in the effectiveness of soaps upon the two types of fabric until after the tenth laundering. After this testing period, soil removal from the all-cotton fabrics was more effective than that from the Dacron-and-cotton fabrics. The heavy-duty soaps were much more effective on the all-cotton fabric than on the Dacron-and-cotton fabrics. Light-duty soaps were more effective on the Dacron-and-cotton fabrics up to the twentieth laundering period but were less effective from this point. Both light- and heavy-duty synthetic detergents were more effective in the removal of soil from Dacron-and-cotton fabrics than from the all-cotton fabrics.

The significance of the results as determined by comparing the standard error of the means from Student's Table of "t" indicated that there were significant differences in the whiteness retention of the all-cotton fabrics and the Dacron-and-cotton fabrics laundered 50 times with the four synthetic detergents and the four soaps used in the study. Differences in the removal of soil from the two types of fabric were not significant.

The same method of computation was used to determine the significance of the differences between synthetic detergents and soaps. The differences in whiteness retention were not significant; however, the differences in the effect of the synthetic detergents and soaps on the removal of soil were highly significant.

Summary

There were differences between the Dacron-and-cotton and the all-cotton fabrics in their response to laundering. The all-cotton fabrics were whiter than the Dacron-and-cotton fabrics before laundering. There was little change in the whiteness retention of either type of fabric throughout the 50 launderings. The Dacron-and-cotton fabrics showed a higher per cent whiteness retention after laundering than did the all-cotton fabrics.

The findings of greatest interest have been those of the differences in detergency effectiveness of soaps and synthetic detergents. While the products used represent a small sample of those available in each group, they indicate detergency action differing from that of advertising claims.

Although the synthetic detergents are rapidly replacing tallow products in consumer usage, the soaps were much more effective in removing the soil applied to the fabrics. There was little difference in the effect of either type of product upon the retention of whiteness.

There was little difference in the effectiveness of the individual products in each group of detergents even though they differed in chemical structure and in the type of laundering for which they were intended. In some cases, products intended for light-duty laundering were more effective in the laundering procedure used than were some of the products sold for heavy-duty usage. Additives, such as builders or brighteners, incorporated into the soap or detergent used apparently had little effect on either the whiteness retention or the removal of soil from these fabrics.

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A Comparative Study of Blankets of Natural and Man-made Fibers and Their Blends

Patricia D. Coleman

Miss Coleman, who is on the staff of the University of Otago in Dunedin, New Zealand, was the AHEA–Phi Upsilon Omicron International Scholarship student at Texas Technological College in 1957-58 and was one of the speakers at the Ninth International Congress on Home Economics last summer. This report is an abstract of her thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Home Economics at Texas Technological College.

TODAY'S market offers the consumer an extensive selection of blankets. Fiber content varies considerably. Both natural and manufactured fibers are available alone and in blends of differing proportions.

Blankets are a commodity found in every household and institution. Every purchaser desires a product which will not only be attractive when new but will maintain a high degree of excellence in use. Normal household usage demands that a blanket successfully withstand laundering or dry cleaning once or twice annually over a period of years. Institutional use requires more frequent cleansing.

Hospitals have an additional problem in the care of blankets, namely sterilization. In recent years there have been unprecedented outbreaks of staphylococcal infection. These outbreaks have occurred in many parts of the world. Investigators believe this is due to the presence of antibiotic-resistant staphylococci in hospitals. Hospital bedding, especially blankets, may be reservoirs of pathogenic organisms unless effectively sterilized. Washing alone is insufficient, and the use of chemical disinfectant agents is open to doubt. Boiling for a sufficient length of time is a sterilization process of recognized efficiency. Some hospitals have experimented with this method of treatment of blankets. New Zealand, the home of the author, uses wool blankets in hospitals and has found this method, sterilization by boiling, can be used successfully even with blankets of this fiber content.

In New Zealand, an important wool-producing country, woolen blankets are manufactured and used, but man-made fibers have not been utilized for this product. The writer observed the wide range of blankets containing all or part man-made fibers which are available on the American market and became interested in this problem of comparing blankets of these various fibers with blankets of wool.

The objectives of this study were:

1. To compare laundering, dry cleaning, and sterilization in the care of blankets of varying fiber content
2. To compare the serviceability of blankets of varying fiber content throughout a series of physical tests
3. To assess which fiber content appears to give the best service and value for household purposes
4. To study the effect of sterilization by boiling on blankets of varying fiber content
5. To assess which fiber content appears to give the best service for use in hospitals where sterilization is necessary

Nine blankets were selected for the study, representing a range of fiber composition from 100 per cent wool, through blends with a decreasing percentage of wool, to those made from all man-made fibers. Three of the blankets were all wool and included a superior quality, standard quality, and one with a shrink-resistant treatment. Other fiber contents were 75 per cent wool–25 per cent Orlon; 50 per cent wool–50 per cent Orlon; 25 per cent wool–25 per cent cotton–50 per cent rayon; all Orlon; 88 per cent rayon–12 per cent Orlon; and 90 per cent rayon–10 per cent nylon.

Tests included in the study were an analysis of fiber content and yarn count; a performance evaluation of change of hand, condition of nap, tendency to pilling, change of color, and resistance to abrasion; and performance tests on dimensional stability, weight per square yard, breaking strength, thickness, compressibility, compressional resilience, and thermal conductivity.

The above tests were made on the original fabrics and after one, five, ten, fifteen, and twenty treatments of laundering, dry cleaning, and sterilization.

Sterilization was included in the cleansing series because its use in hospitals is being advocated in New Zealand. The method of sterilization employed was boiling with a non-ionic detergent.

Conclusions indicated that, in general, dry cleaning gave preferable results to laundering as a cleaning method for household blankets with the exception of the all-Orlon fiber content. With the shrink-resistant all-wool blanket and the wool-Orlon blends, dry cleaning showed only a minor margin of superiority over laundering while for the blends containing rayon, dry cleaning was very preferable. The inexpensive rayon blankets needed the more expensive method of cleansing.

Three blankets in the study were given special commendation for their good performance in laundering and dry cleaning because of their high dimensional stability and superior performance in other tests. These blankets were the shrink-resistant wool, the all-Orlon, and the 50 per cent wool–50 per cent Orlon blend. They retained a high dimensional stability; very good hand, nap, and color; and showed only very slight tendency to pilling in dry cleaning where some blankets of other fiber content pilled badly. Performance in weight stability, thickness, breaking strength, and compressional resilience tests was very satisfactory. All three of these blankets may be regarded as giving good value for household purposes and a potential life of long service with good care in use, cleansing, and storage. A choice between them would be a personal matter.

For sterilization, the all-wool and the wool blends, the 75 per cent wool–25 per cent Orlon, and the 50 per cent wool–50 per cent Orlon were the most satisfactory.

The author recommends that standards be developed for blankets of blends of fibers and that labels be made more specific as to method of cleansing best for the blanket.

New Equipment for AHEA Membership Room

LEFT. *In the membership room at the headquarters of the American Home Economics Association, a record number of memberships are being handled. Left to right, Mrs. Vera Cresswell, Mrs. Margaret Nicholson, Mrs. Lynn Zuber, Mrs. Martha Davis, and Beth Thring.*

RIGHT. *Headquarters staff members explain new super elevator file to AHEA officers. The file has trays that are brought into position by electricity and will hold 87,000 cards. The storage cabinet at right holds receipts and other records.* LEFT TO RIGHT: *Mrs. Ann Driscoll, Mrs. Florence Low, treasurer; Mrs. Ella McNaughton; and Olga P. Brucher, president.*

This article shows the value of relating design of household storage facilities to the energy expenditure required of the person using the facility. The findings provide data on dimensions that will be valuable to architects and builders as well as to families planning storage.

Human Energy Expenditures as Criteria for the Design of Household-Storage Facilities

Earl C McCracken and Martha Richardson

Dr. McCracken is a physicist and Dr. Richardson is a nutrition specialist in the Housing and Equipment Laboratory of the Institute of Home Economics in the Agricultural Research Service of the U. S. Department of Agriculture. The work reported is from a contributing project to the North Central Region housing research program.

THE number of permanently handicapped homemakers in the United States has been estimated to be more than 10 million (*1*). The population includes also an increasing number of older women who are infirm. In spite of disability, many of them must carry on their usual household tasks. These groups of homemakers have become so large as to focus attention on the need for special housing features designed to reduce to a minimum the expenditure of human energy in housekeeping.

Benton stated in 1953:

> Housewives, who constitute the largest segment of the working cardiac population (*2, 3*), have apparently been overlooked in programs of rehabilitation. As far as is known, there have been no energy cost studies reported for such patients. The need here is critical, since the woman with cardiac disease continues, of necessity in many instances, to do kitchen and housework. Such programs should consist of retraining as well as the development of energy conserving methods for the performance of household duties and the design of household and kitchen equipment (*4*).

Few studies have been reported on the comparative energy costs of using housing facilities of different designs. In a recent study of the energy expenditures in reaching to shelves of different heights and of different methods of reaching, using small cardboard box "loads," Bratton found that oxygen consumption increased with height of reach and that reaching to three inches above the floor required more energy when knee-bend (squat) was used than when trunk bend (stoop) was used (*5*).

In connection with the development of energy-saving kitchens, the Housing and Equipment Laboratory has conducted studies of the comparative energy costs of using various kinds of working and storage facilities and of performing household tasks by different methods. Results of a study of energy expenditures in using built-in ovens at different heights were reported in 1956 (*6*).

The studies reported here were designed to determine the most satisfactory heights for the storage of household articles and to compare the energy costs of using different designs of storage facilities. The study was divided into three main parts, each involving different storage areas and procedures: (1) subjects standing and using both hands to place a 5-pound load on, and remove it from, shelves of an open floor cabinet; (2) subjects sitting and standing and using one and two hands to place a load on, and remove it from, shelves above 36-inch-high surfaces of various depths; and (3) subjects standing and placing a pan on, and removing it from, storage areas of different designs—a hook on a perforated hardboard above a 36-inch work surface, the fixed top shelf and the top pull-out shelf of a conventional base cabinet, and the top shelf of a rotary corner base cabinet.

General Plan and Procedures

In the conduct of the experiment, two choices were possible—many subjects performing the activity once or a few times, or a small number of carefully selected subjects performing the activity many times. The latter choice was adopted because it was known that considerable time and practice would be necessary to reduce certain activities to standard repetitive procedures.

The subjects participating in the study were homemakers whose ages ranged from 20 to 46 years. Table 1 gives selected physical characteristics and basal metabolic rates of these women. In the selection of the subjects, certain limiting conditions were established: a basal metabolic rate within 15 per

cent of standard (7); stature between 62 and 65 inches to correspond to the average stature of American women (8); and weight between 110 and 160 pounds. The weight range was restricted on the assumption that women of lesser or greater weight would not be able to carry on continuously some phases of work that involved relatively great exertion without becoming so fatigued as to influence the results of the experiment.

Two subjects were used each day, alternating times of rest (reclining) and work. Each work session consisted of a preactivity period (standing or sitting at rest, depending upon the activity to be performed), activity periods (the work sequence), and a postactivity period (identical with the preactivity period). Expired-air samples were collected during each of the periods. A warm-up practice time during which no expired air was collected immediately preceded each activity period.

A procedure was defined as a complete operation cycle, i.e., starting from a position with hands at sides or resting on the working surface through storage of the utensil to the original position of the subject, and reversing the procedure to return again to the original position. The time for an activity period and number of complete procedures in it were recorded and used to calculate time per procedure.

TABLE I

Height, weight, age, and basal metabolic rate of the women subjects

SUBJECT	HEIGHT*	WEIGHT*†	AGE†	BASAL METABOLIC RATE	
	inches	*pounds*	*years*	*cal/min*	*per cent‡*
A	64.75	128	34	0.87	−12.0 (mean of 2)
B	64.75	146	40	0.97	− 6.0 (mean of 3)
C	64.00	133	21	0.97	− 8.0 (mean of 2)
D	64.00	128	30	0.83	−13.5 (mean of 2)
E	64.00	152	40	1.04	− 1.5 (mean of 2)
F	63.75	140	40	0.90	− 9.0 (mean of 5)
G	63.50	141	35	0.88	−12.0 (mean of 2)
H	63.50	130	46	1.00	+ 2.5 (mean of 2)
I	63.00	138	32	0.93	− 7.0 (mean of 2)
J	62.50	139	36	0.87	−12.0 (mean of 2)
K	62.50	113	37	0.88	+ 1.5 (mean of 2)
Mean	63.66	135	36	0.92	− 7.0

* In stocking feet.
† At time of initial determination of basal metabolic rate. Weight in lightweight work clothing.
‡ Deviation from Aub-DuBois Standard as modified by Boothby and Sandiford (7).

Because the primary purpose of these studies was to determine the working conditions or method of work or type of equipment that would enable a homemaker to accomplish an activity with a minimum expenditure of energy, costs were computed on a basis of calories per procedure. Expenditures for the activity on a calorie-per-minute basis are included in the tables for those who wish to calculate energy costs of activities over longer periods.

An indirect method was used to determine energy expenditures. Expired air was collected in a Müller respirometer (*9, 10*). Analysis of samples of expired air for oxygen content was made by a Pauling-type electronic oxygen analyzer. Calorie equivalents were calculated by a formula developed by Weir (*11*), who has shown that, for the range of energy expenditures involved in the study, the calorie value of one liter of oxygen is practically independent of the total respiration quotient and that variations in respiration quotient from day to day because of diet changes do not introduce appreciable error.

No attempt was made to modify the eating patterns of subjects. Possible differences in energy expenditure attributable to specific dynamic action of food (*12*) were minimized by randomizing the order of performance of activities. Determination of the energy expenditures during the preactivity and postactivity periods also provided a basis for detecting any change in specific dynamic action and/or any possible oxygen debt.

The general experimental design[1] adopted for the project required the grouping of three activities in each work sequence. Each of the activities was of a different "degree" of energy expenditure. For each study the shelf heights or the combinations of shelf heights with reach-over distances were divided into three groups assumed to be "hard," "medium-hard," and "easy" for each particular activity. One height or combination from each group was used in each work sequence. The three groups were randomized in the sequences as were the times of day in which the same sequences were performed. The activities in each group were selectively randomized to bring about the same number of performances of the activity by each worker.

Special Procedures and Results for Each Activity

Storage on shelves in open floor-cabinet

Five subjects (B, C, E, H, and K) participated in this phase of the study. It simulated an actual situation in which the object to be stored would be on a work surface to the side of a tier of open shelves placed 4, 12, 20, 28, 36, 44, 52, 60, and 68 inches above the floor. An 8-inch increment, rather than a smaller one, was used in increasing shelf

[1] Statistical consultants for the project were Glenn L. Burrows, formerly statistical consultant, Statistical Clearance and Standards, AMS, and E. James Koch, biometrician, Biometric Services, ARS.

height on the assumption that energy measurements at those different heights would be more apt to yield significant differences. The highest shelf was placed at 68 inches because not all of the subjects could reach the next height of 76 inches.

The activity, starting with hands at sides, consisted of lifting with both hands a 5-pound pan-and-load from the 36-inch-high surface at the left of the subject and placing it on a designated shelf of the tier directly in front of her. The subject pushed the pan forward until it touched the wall back of the 8-inch-deep shelf and then dropped her hands to her sides before reversing the operation. This activity was repeated for sampling periods of 3 minutes except for shelves at the 4-inch and 12-inch heights, which early trials proved to be very fatiguing. These periods were 2 minutes.

The procedures were repeated at the subjects' own rhythms. A uniform procedure time could not be followed because of the differences in times required to place the pan on the shelves at widely separated heights. Each subject's rhythm at each height remained constant throughout the study.

The number of procedures in an activity period was ascertained by means of a counter, connected to a light chain across the shelf, which registered as the pan was placed in storage position.

The results of 486 activity measurements are recorded in table 2. Average expenditures at the various heights varied from 81 to 238 per cent above the average basal metabolic rate for the subjects.

The relationship between energy expenditure and shelf height is shown in chart 1, Curve A. The rapid decrease in the amount of energy used as shelf height was increased from 4 to 12 to 20 to 28 inches above the floor was associated with the fact

TABLE 2

Average energy expenditures of 5 women in placing a 5-pound load on shelves at various heights in an open floor-cabinet

SHELF HEIGHT ABOVE FLOOR	ENERGY EXPENDITURE		
	Per Procedure	Per Minute	Above Basal*
inches	*calories*	*calories*	*per cent*
4	0.506	3.28	238
12	0.388	2.81	190
20	0.297	2.29	131
28	0.215	1.88	94
36	0.198	1.79	85
44	0.204	1.76	81
52	0.226	1.85	91
60	0.256	1.98	104
68	0.321	2.17	124

* Average basal metabolic rate 0.97 for subjects B, C, E, H, K.

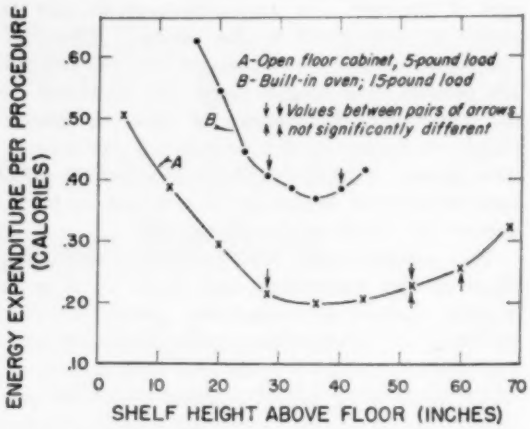

CHART 1. Average energy expended per procedure (A) by 5 women in storing a 5-pound load on shelves in an open floor-cabinet and (B) by 6 women in placing a 15-pound load in and removing it from a built-in oven at various elevations

that progressively less body lifting was required. There was very little energy change at heights requiring primarily horizontal arm movements. As the shelf height was raised above 36 inches, energy costs increased, undoubtedly because of the necessary higher elevation of arms and load; but the increase was not so rapid as when more of the body had to be lifted.

Pairs of arrows on Curve A in chart 1 bound regions in which there were no significant differences in the means as shelf heights were increased from 28 to 36 to 44 to 52 inches and from 52 to 60 inches. Curve B, which presents results from the previously reported study of energy expenditure in relation to oven height, is included to show the similarity in shape of the two curves. The pair of arrows on Curve B also bounds a region of no significant differences in energy requirements.

Storage on open shelves above work surfaces

Depth of a 36-inch-high surface, attached to the tier of shelves used for the floor cabinet, was varied by the use of two-inch leaves similar to those for a dining table. The procedure was the same as in the previous study except that the load was lifted from and returned to the surface directly in front of the subject.

The shelf depth was 8 inches. Six reach-over distances (11, 13, 15, 17, 19, and 21 inches) were used. Photographs 1 and 2 show the equipment set up for different reach-over distances while sitting. Reach-overs of less than 11 inches were

1. Worker placing utensil on 60-inch shelf over 13-inch reach-over while sitting

2. Worker placing utensil on 60-inch shelf over 21-inch reach-over while sitting

not included because it had been observed in the floor-cabinet study that the subjects had to stand approximately one foot from the shelves in order to have room for arm manipulation. A maximum reach-over of 21 inches was used on the assumption that work-surface depth more than 25 inches and shelves less than four inches are not practical.

Two-hand reach-over—subject standing. Four subjects (D, E, H, and K) participated in the study of the energy required, while standing, to reach to shelves above the surface. Four shelf heights (44, 52, 60, and 68 inches) were used. A total of 288 activity measurements was made.

The sampling period was 3 minutes for each activity except the combination of 68-inch shelf height and 21-inch reach-over. Because early trials proved that combination to be too fatiguing, the period was reduced to 2 minutes.

Analysis of the 8-inch increment study indicated a break in the energy-height curve between shelf heights of 60 and 68 inches. Further investigations were made at a height of 64 inches, at three separated reach-over distances, in order to establish the slope of the curve in this region.

Results are given in table 3. The data show a general trend in calories per procedure toward increase in energy requirements as either shelf height or reach-over distance was increased. Shelf height had a greater effect on energy requirements than did reach-over distance.

TABLE 3

Average energy expenditures of 4 women in storing a 5-pound load at various shelf heights with both hands while standing and reaching over different distances

SHELF HEIGHT (INCHES ABOVE FLOOR)	CALORIES PER PROCEDURE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*							CALORIES PER MINUTE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*						
	11	13	15	17	19	21	Average	11	13	15	17	19	21	Average
44	0.202	0.214	0.214	0.239	0.239	0.227	0.223	1.61	1.74	1.63	1.80	1.80	1.75	1.73
52	0.239	0.214	0.239	0.239	0.252	0.265	0.241	1.84	1.59	1.80	1.84	1.94	1.83	1.80
60	0.239	0.277	0.277	0.302	0.277	0.290	0.277	1.71	1.95	1.84	1.99	1.92	2.03	1.90
64†	0.302		0.315			0.365		2.23		2.27			2.47	
68	0.328	0.328	0.340	0.353	0.378	0.428	0.359	2.07	2.10	2.17	2.22	2.33	2.60	2.24
Average	0.252	0.258	0.268	0.284	0.287	0.302		1.81	1.85	1.86	1.97	2.00	2.05	

* Inches beyond front edge of shelf. Height of surface, 36 inches above floor.

† Data for 64-inch height not used in computing table averages. They were obtained after completion of 8-inch increment study since analysis of the data showed a break in the energy-height curve between 60 and 68 inches.

Two-hand reach-over—subjects sitting. Six subjects (B, D, E, F, G, and H) participated in this phase of the study.

The subjects sat on a posture stool, whose seat was 25 inches above the floor. The only other variation from the standing study was that, beginning at 52 inches, the shelf heights were increased by 4-inch increments because, as found in the previous study, changes of 8 inches proved to be too large for application of results to problems of storage design at these heights. Maximum shelf height was 68 inches (32 inches above the surface).

The results from a total of 432 activity measurements are given in table 4.

Again there was an increase in the amount of energy used as shelf heights were increased. Appreciable increases in energy as reach-overs were increased were apparent only at the greatest distances studied—19 and 21 inches.

Comparison of the data for calories per procedure in tables 3 and 4 indicates that for all reach-over distances the average energy expenditure for reaching to successively higher shelves increased more rapidly when the subjects were sitting than when they were standing. With the shelf in its lowest position, 44 inches from the floor (8 inches above the surface), the subjects expended considerably less energy when sitting, regardless of reach-over distance. In reaching over distances of 11, 15, and 21 inches, the only reach-over distances appearing in both tables for a shelf height of 64 inches (28 inches above the surface), they used approximately the same amount of energy whether sitting or standing. The only reach-overs possible from a sitting position when the shelf was at a height of 68 inches (32 inches above the surface) were 11 and 13 inches. At these distances significantly more energy was required from the sitting position.

One-hand reach-over—subjects standing. Six subjects (A, F, G, H, I, and J) participated.

The activity consisted of lifting a one-pound plywood box, of the same dimensions and weight as an "economy-size" cereal box, from the surface directly in front of the subject, placing it on a shelf at the selected height, and pushing it forward until it touched the wall behind the shelf.

The subject then brought her forearm or hand or both down to rest on the surface. The procedure was reversed to bring the box back to the surface. To register completion of the procedure, the subject touched a counter at hand-rest position. Procedures were repeated for sampling periods of 3 minutes.

Preliminary tests showed that not all of the subjects were able to reach to 76 inches across reach-over distances greater than 15 inches. Previous work also showed no significant differences in energy expenditure at shelf heights from 52 to 64 inches across a reach-over distance of 11 inches. As a result, combinations 52-11, 56-11, 60-11, 76-17, 76-19, and 76-21 were omitted from the study.

The results of 1,080 activity-period measurements are shown in table 5. Data show a trend toward increased energy expenditure with increased shelf height and reach-over distance. The increase was not as regular nor as large when reach-over distance was made greater as when shelf height was increased. With the one-pound load the increase was less than with the five-pound load used previously.

One-hand reach-over—subjects sitting. The six homemakers (A, F, G, H, I, and J) who participated in the one-hand reach-over standing study were the subjects in this phase of the work.

TABLE 4

Average energy expenditures of 6 women in storing a 5-pound load at various shelf heights with both hands while sitting and reaching over different distances

SHELF HEIGHT (INCHES ABOVE FLOOR)	CALORIES PER PROCEDURE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*							CALORIES PER MINUTE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*						
	11	13	15	17	19	21	Average	11	13	15	17	19	21	Average
44	0.164	0.160	0.161	0.193	0.188	0.186	0.175	1.65	1.66	1.63	1.92	1.71	1.86	1.74
52	0.195	0.168	0.213	0.198	0.224	0.268	0.212	1.79	1.73	1.86	1.79	2.00	2.12	1.89
56	0.222	0.208	0.219	0.204	0.231	0.268	0.223	1.84	1.89	1.94	1.85	1.92	2.31	1.95
60	0.237	0.265	0.248	0.252	0.271	0.272	0.257	1.89	2.17	2.03	2.00	2.18	2.33	2.10
64	0.297	0.275	0.330	0.304	0.325	0.362	0.315	2.33	2.15	2.39	2.34	2.29	2.66	2.37
68†	0.344	0.407	‡					2.34	2.67	‡				
Average	0.223	0.213	0.234	0.231	0.248	0.271		1.90	1.93	1.97	1.98	2.02	2.26	

* Surface 36 inches above the floor.

† Data not used in computing column averages. Because energy increases due to vertical distance were larger than those due to horizontal reach-over, column averages could not be analytically compared if they were included.

‡ Workers unable to reach shelves at and beyond this combination.

The work was performed under the same conditions as the previous study except that the workers were seated on a posture chair which was on a castered platform 8½ inches high. The chair seat was 16½ inches above the platform—25 inches above the floor. The highest shelf that all subjects could reach when sitting on the chair was 68 inches with a 15-inch reach-over.

The results of 972 measurements are recorded in table 6. The trend again was toward greater expenditures at the higher shelf-height, greater reach-over combinations. The increase as the shelf height was increased was greater when the subjects were sitting than when they were standing.

The data in tables 5 and 6 show that, in calories per procedure, reaching with one hand to shelf heights of 52 and 56 inches required less energy over all of the reach-over distances when sitting than when standing. Wherever comparison between data in the tables was possible, as shelf height was increased to 60, 64, and 68 inches, the activity required progressively more energy when the subjects sat than when they stood. The increases were significant at shelf heights of 64 inches and above.

Storage of fry pan in 4 locations

In the third part of the study, in which six homemakers (B, D, E, F, G, and H) participated, a 1¾-pound fry pan was stored in four locations: on a hook on a perforated hardboard above the surface, on a fixed shelf of a conventional base cabinet, on a pull-out shelf of a conventional base cabinet, and on a shelf of a rotary base cabinet. Photographs 3 to 6 show position of worker with respect to the various storage locations. Heights of the various locations are given in table 7.

With the subject standing, the procedure consisted of moving the fry pan with one hand from a 36-inch-high surface to the storage location and returning it to the surface. For storage in cabinets with doors, it included opening and closing the

TABLE 5

Average energy expenditures for 6 women in storing a 1-pound load at various shelf heights with one hand while standing and reaching over different distances

SHELF HEIGHT (INCHES ABOVE FLOOR)	CALORIES PER PROCEDURE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*							CALORIES PER MINUTE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*						
	11	13	15	17	19	21	Average	11	13	15	17	19	21	Average
52		0.146	0.144	0.155	0.151	0.164	0.152		1.55	1.51	1.59	1.59	1.65	1.58
56		0.152	0.155	0.161	0.164	0.161	0.159		1.52	1.59	1.63	1.65	1.55	1.59
60		0.161	0.155	0.158	0.165	0.171	0.161		1.63	1.60	1.63	1.68	1.66	1.63
64	0.158†	0.174	0.170	0.183	0.179	0.181	0.178	1.59†	1.65	1.60	1.74	1.66	1.71	1.68
68	0.186†	0.180	0.171	0.193	0.185	0.215	0.189	1.75†	1.70	1.66	1.78	1.70	1.88	1.74
72	0.197†	0.209	0.219	0.237	0.237	0.256	0.232	1.81†	1.85	1.85	2.02	1.97	2.00	1.94
76	0.241†	0.265†	0.275†					1.95†	2.07†	2.09†				
Average		0.170	0.171	0.181	0.180	0.191			1.65	1.64	1.71	1.70	1.74	

* Surface 36 inches above floor.
† Data not used in computation of averages.

TABLE 6

Average energy expenditures for 6 women in storing a 1-pound load at various shelf heights with one hand while sitting and reaching over different distances

SHELF HEIGHT (INCHES ABOVE FLOOR)	CALORIES PER PROCEDURE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*							CALORIES PER MINUTE WITH REACH-OVER DISTANCE OF SPECIFIED NUMBER OF INCHES*						
	11	13	15	17	19	21	Average	11	13	15	17	19	21	Average
52	0.139	0.146	0.141	0.141	0.149	0.160	0.146	1.63	1.65	1.63	1.69	1.79	1.84	1.70
56	0.150	0.154	0.149	0.151	0.169	0.174	0.156	1.69	1.73	1.70	1.70	1.76	1.86	1.74
60	0.155	0.164	0.161	0.171	0.175	0.192	0.170	1.71	1.79	1.74	1.84	1.88	1.92	1.81
64	0.184	0.189	0.190	0.194	0.218	0.232	0.204	1.88	1.90	1.86	1.98	1.95	1.99	1.93
68†	0.220	0.224	0.232					2.02	1.98	2.12				
Average	0.158	0.164	0.160	0.165	0.175	0.194		1.73	1.76	1.74	1.80	1.83	1.90	

* Surface 36 inches above floor.
† Data not used in computing averages.

Photos 3 to 6, left to right above. *Worker hanging fry pan on vertical perforated hardboard; storing fry pan on base-cabinet fixed shelf; storing pan on rotary base-cabinet shelf; and storing pan on base-cabinet pull-out shelf*

door when the pan was stored or removed. The workers started the procedure with hand at side and returned it to that position after placing the pan in storage and after returning it to the surface. As the hand was dropped at the end of the procedure a counter was touched, providing a record of the number of procedures in an activity period.

Order of performance of the four activities was randomized as was the time of day of performance of duplicate activity randomizations. Each woman completed 56 assays for each storage location. Table 7 gives the results from 336 measurements.

In calories per procedure, for storing the fry pan in the four locations, hanging it on the perforated hardboard required the least expenditure of energy, and placing it on a sliding shelf behind a base-cabinet door required the greatest expenditure. Storage in the other two locations required intermediate energy expenditures which were not significantly different from each other.

TABLE 7

Average energy expenditures in calories per procedure and calories per minute for 6 women in storing a 1¾-pound fry pan in 4 different places

PLACE OF STORAGE	DISTANCE ABOVE FLOOR	ENERGY EXPENDITURE	
		Per Procedure	Per Minute
	inches	*calories*	*calories*
Side-wall perforated hardboard	56*	0.24	1.58
Base-cabinet fixed shelf (behind door)	20⅜	0.47	1.73
Base cabinet pullout shelf (behind door)	20⅜	0.66	1.79
Rotary-cabinet shelf	20⅜	0.48	1.59

* 20 inches above work surface.

Analysis of Data and Discussion of Results

In all statistical analyses, the Duncan test (*13*) was applied. In some instances, results were definite. In others, overlapping of groups of no-significant-difference values made secondary analyses or data interpretation necessary. These interpretations were made in two ways: graphically, as described below, and numerically, by a procedure to be published elsewhere. In each phase of the study, graphical and numerical interpretations gave identical results.

In the graphic method, the progressive array of energy means for a given activity was plotted against the height, or against the height-reach-over combinations where reach-over was a factor, and straight lines were drawn through the various segments of the graph.

Chart 2 is illustrative of the method as applied

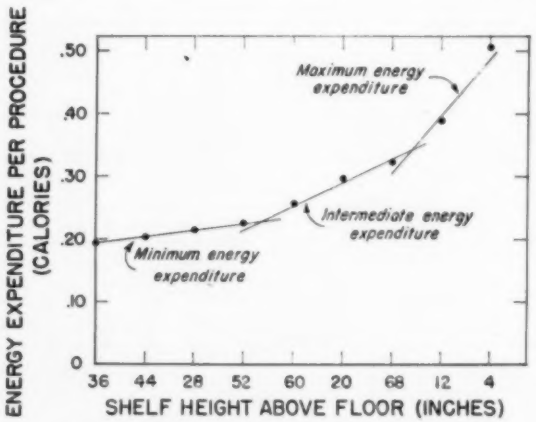

CHART 2. Average energy expenditures per procedure by 5 women in storing a 5-pound load at various shelf heights with both hands

to the data on floor-cabinet storage. Two breaks in the curve are evident between the points representing 52 and 60 inches and between the points for 12 and 68 inches. Each break represents a point in the progressive array of means at which there is a marked increase in change in energy-expenditure values as shelf height is changed. Interpretation of results by this method is based on the location of these changes in slope of the curve.

Table 8 gives the shelf heights and shelf-height reach-over combinations that required minimum, intermediate, and maximum energy expenditures as interpreted by the two methods for each phase of the open-shelf study.

Interpretation of Results in Relation to Design of Storage Areas

For the storage of frequently used items and of those requiring two hands for placement and removal, shelves in floor cabinets should not be lower than 28 inches nor higher than 52 inches from the floor. For the storage of lighter-weight objects or those less frequently used, shelves may be between 20 and 28 inches and between 52 and 60 inches. Shelves at heights outside these limits require maximum energy to use and should be used for the storage of seldom-used articles.

When reaching-over is required for the use of shelves, as is the case with wall cabinets placed over a work surface, both the height of the shelf and the extent of the reach-over influence the energy requirement.

Since kitchen-counter areas are usually 25 inches deep, the recommended minimum shelf depth at a height in a cabinet above the surface is the difference between 25 inches and the maximum reach-over distance at that height.

For the storage of items that require two hands for placement and removal, which is to be done from a standing position, shelves from 36 to 52 inches from the floor (zero to 16 inches above a 36-inch counter height) can be used with a minimum expenditure of energy when reaching over all distances up to 21 inches. This indicates that for a conventional wall cabinet, shelves up to 52 inches from the floor can be as shallow as 4 inches and still require only the minimum expenditure of energy.

For items that can be placed and removed with one hand while standing, storage on a shelf as high as 72 inches can be done with a minimum expenditure of energy but the reach-over at that height is limited to 11 inches. A shelf at that height over a 25-inch work surface should be at least 14 inches deep, and a shelf at a height of 68 inches should be at least 8 inches deep.

Items requiring two hands for placement and removal from a sitting position can be stored with a minimum expenditure of energy on shelves up to a height of 60 inches with a reach-over of 21 inches (minimum shelf depth 4 inches) and at a height of 64 inches, with a maximum reach-over of 13 inches. Recommended minimum shelf depth at a height of 64 inches above a 25-inch work surface is 12 inches.

Items requiring one hand for placement and

TABLE 8

Shelf heights and shelf-height reach-over combinations for storage of articles with minimum, intermediate, and maximum energy expenditures per procedure while standing and sitting and while using one and two hands

ENERGY EXPENDITURE	SHELF HEIGHT, OPEN FLOOR CABINET; WORKER STANDING, USING 2 HANDS	SHELF-HEIGHT AND REACH-OVER DISTANCE USING OPEN SHELVES ABOVE WORK SURFACE			
		Worker Standing		Worker Sitting	
		Using 2 hands	Using 1 hand	Using 2 hands	Using 1 hand
	inches	*inches*	*inches*	*inches*	*inches*
Minimum	28 to 52	44—11, 13, 15, 17, 19, 21 52—11, 13, 15, 17, 19, 21 60—11	44—11, 13, 15, 17, 19, 21 52—11, 13, 15, 17, 19, 21 56—11, 13, 15, 17, 19, 21 60—11, 13, 15, 17, 19, 21 64—11, 13, 15, 17, 19, 21 68—11, 13, 15, 17 72—11	44—11, 13, 15, 17, 19, 21 52—11, 13, 15, 17, 19, 21 56—11, 13, 15, 17, 19, 21 60—11, 13, 15, 17, 19, 21 64—11, 13	44—11, 13, 15, 17, 19, 21 52—11, 13, 15, 17, 19, 21 56—11, 13, 15, 17, 19, 21 60—11, 13, 15, 17, 19, 21 64—11, 13, 15, 17
Intermediate	20 to 28; 52 to 68	60—13, 15, 17, 19, 21 64—11, 13, 15, 17, 19, 21 68—11, 13, 15, 17, 19	68—19, 21 72—13, 15, 17, 19, 21 76—11, 13, 15	64—15, 17, 19, 21 68—11, 13	64—19, 21 68—11, 13, 15
Maximum	Below 20; above 68	68—21			

removal from a sitting position can also be stored with minimum expenditure of energy on shelves up to a height of 60 inches with a reach-over of 21 inches (minimum shelf depth 4 inches), and at a height of 64 inches, with a maximum reach-over of 17 inches. Recommended minimum shelf depth at a height of 64 inches above a 25-inch work surface is 8 inches.

Shelves outside these limits of height and reach-over should be used for storage of less frequently used articles because of the greater energy requirements for their use.

Hanging a utensil on the wall in the designated position required less energy than any other type of storage tested. The next-best storages were the top shelf of the rotary base cabinet and the top fixed shelf behind the base-cabinet door. In this group of locations a sliding shelf behind a cabinet door required more energy expenditure than any other storage investigated. The amount above that required for storage on a fixed shelf in the same location can be accounted for by the extra motions required to pull the shelf out and push it back into place. Since in each base-cabinet storage the utensil was in sight at the front of the shelf, it was not necessary to stoop to see or to remove it from the shelf.

Summary and Conclusions

Using homemakers of average height as subjects, measurements were made of the comparative energy expenditures for storing utensils on open shelves and in base cabinets. Facilities used simulated open-shelf floor cabinets and wall cabinets above working surfaces of various depths, rotary base cabinets, conventional base cabinets, and perforated hardboards above a work surface. Storing was done while sitting and while standing and while using one and two hands.

Although interpretations are based on calories per procedure, energy values are also reported in calories per minute for comparison with any other available data for the activities and for those who wish to calculate energy costs over longer periods.

Regions of shelf heights and combinations of shelf heights with reach-over distances were found in which there were no significant differences in energy requirements. For the floor cabinet, energy requirements were increased as the shelf was raised above or lowered below 36 inches. The increase was greater as the shelf was lowered. For the open-shelf cabinet above a work surface, energy values increased more rapidly with increased vertical height of shelf than with increased horizontal reach-over distance. Storage on the perforated hardboard above the work surface required less energy than storage in base cabinets; storage on a pull-out shelf or drawer in a conventional base cabinet required more energy than any of the other methods of storage in this group.

For storage on open shelves above a work surface, less energy was required while sitting than while standing at the lower shelf heights; at the higher shelf heights more energy was required when sitting.

On the basis of a work surface 25 inches deep, recommendations are given for wall-cabinet shelf depths at the various shelf heights studied.

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Nutrition in Rehabilitation

The following articles are part of a series of articles planned and prepared for the JOURNAL *by the Joint Committee on Rehabilitation of the Physically Handicapped, a committee of the American Home Economics Association and the American Dietetic Association. Co-chairmen of the committee are Mrs. Julia Judson for the AHEA and Arlene Reams for the ADA. A. June Bricker is chairman of the information and publicity subcommittee. The first article in the series appeared in the November 1958* JOURNAL.

Education of the Patient

Arlene Reams
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Rehabilitation actually begins as soon as the patient has progressed beyond the critical state of his illness. The hospital dietitian, as a member of the medical team, can contribute immeasurably toward the full rehabilitation of the patient, not only with respect to his nutritional status but often toward an improved physical and emotional state. In hospitals, the dietitian's attention and effort may be centered on helping to restore the breadwinner to his or her job more often than to rehabilitating the homemaker.

Advancement in our knowledge of medical science, biochemistry, and nutritional requirements has placed a new emphasis on the relationship between the foods that we eat and our health status. Many patients are sent home from the hospital with advice that they must continue to avoid certain foods for an indefinite period of time in order to further restore them to health and to maintain their physical well-being. When these patients are being prepared for discharge from the hospital, they are given classes and private instruction on the basic principles governing the diet they are to follow and what foods they need and should include in their daily intake. A bland diet is frequently prescribed for patients convalescing from gastrointestinal diseases. Many times this regimen places restrictions on the individual that are not to his liking and which seem at first to be impossible for him to follow. The businessman may not find it easy to forego the luncheon cocktail or the before dinner highball; others may contend that without the spice and generous amount of pepper that they have grown used to eating, the food is flat and tasteless; while some will be certain that without their usual 12 or 15 cups of hot coffee daily, they cannot accomplish their day's work. When the treatment indicated includes restrictions of elements such as sodium, constituents such as fats or carbohydrates, or calories, the problems that face the patient may seem so great as to discourage him from even making an effort to follow the recommended treatment.

The dietitian has an obligation in the rehabilitation of these patients. In addition to instruction concerning the dietary principles that the physician wishes him to follow, the patient requires motivation, a thorough understanding of the aims and purposes, and some prediction as to the outlook for the future regarding his food habits. If we include in the rehabilitation team the wife or mother of the patient and invite her into the instruction class, the obstacles may not seem so formidable. If the patient can be convinced that he need not greatly change his way of life to accommodate it to the physical needs of his body, it will be easier for him to return to his job and to establish a new "normal" for intake and activity. This way he can approach the maximum in rehabilitation, and readmission to the hospital for treatment of the disease can be avoided. His full cooperation and acceptance of the treatment can be expected only after he understands that his situation is not hopeless; that a lunch box meal or a restaurant meal can be planned or ordered which will meet his needs, at the same time be appetizing and satisfying, and closely approach his previous normal meal pattern. He also needs to recognize

that meals prepared and served at home can be tasty and enjoyable for him, meet his nutritional requirements, and still, with only slight variation, be adequate and pleasing to the other members of his family.

Rehabilitation for the patient with a chronic disease may take a very different approach. If his hospitalization has continued for a long period of time, one of the first steps may be inducing him to have his meals at a table with three or four other patients. In this atmosphere, he can also be encouraged to participate socially. By offering him a selection of one or two menu items, we can sometimes promote an interest in food and improve his attitude in general. If movement of fingers, hands, or arms is impaired, he may be taught to use special table service or be served on a plate that has a rim or sides such as small children use. Raising or lowering of the table top may be the only change required to meet the needs of some patients, while for others it may be necessary to serve all foods in bite-size pieces so that they can feed themselves.

The degree of rehabilitation that can be accomplished before the patient is discharged may greatly affect his acceptance of the home environment to which he returns; it will help to promote a continuing effort on the part of the patient for further rehabilitation and may prevent or postpone a need for future hospitalization.

Nutrition in Rehabilitation of the Handicapped

Nelle M. Sailor
Nutrition Consultant
Visiting Nurse Service of New York

The Visiting Nurse Service of New York provides part-time nursing care in the home to the sick of all ages. Care includes physical therapy; family health supervision, including nutrition guidance; maternity service, both pre- and post-partal instruction, and care; and help in solving social and economic problems, either through the resources of the agency or by referring the family to other agencies. This work is carried out by the nurses and physical therapists. All patients are under medical supervision. Since the work is in a home setting, the patient is seen as a member of the family and all instruction is family-centered.

Nutrition is a vital part of health maintenance. The aim of the nutrition program is to promote health for individuals and families by improving their food habits. The agency provides for a continuing in-service educational program to promote the highest quality of service to the community through the professional development of the staff. There is also consultant service to which the nurse turns for help on problems she encounters in the home.

My role as nutrition consultant in the rehabilitation program is to work with the consultant in this area and with the staff nurses and physical therapists, giving them help in interpreting special diet orders given by the physician and adapting them to the patient's cultural patterns and economic status, making an evaluation of the patient's dietary habits, or suggesting simplified menu plans for the physically handicapped homemaker. For example, a young man, a double amputee, had to reduce his weight before he could be fitted for artificial limbs. A diabetic Italian woman with arthritis who did her work from a wheelchair needed help in adapting the diabetic diet to her cultural background and at the same time planning meals that could be easily prepared. Then there was the case of the hemiplegic homemaker who had the use of only one hand and needed advice about lightweight kitchen equipment as well as a suggested market order and menus. In another home, the need was for lunches which a working daughter could leave at her crippled mother's bedside.

An appealing as well as challenging situation required the planning of meals for a preschool post-polio patient who had difficulty in swallowing. This involved not only knowing about foods of high nutritive value which were easy to swallow but required an understanding of the exercises given by the physical therapist to strengthen the tongue and throat muscles. As the exercises progressed, it was important to make changes in the diet incorporating foods that would help contribute to the exercise program.

My contribution to the rehabilitation program is the education and guidance I am able to give the nursing staff who seek help in interpreting the dietary needs of individuals and families.

The Dietitian and Nutritionist as Members of a Home Care Rehabilitation Team

Joann Legant
Therapeutic Dietitian
Grasslands Hospital, Valhalla, New York
and
Maryrose J. Baiano
Public Health Nutritionist
Westchester County (N. Y.) Department of Health

An organized Home Care Program offers an excellent opportunity for the hospital dietitian and the community nutritionist to work together as members of the rehabilitation team.

In Westchester County, New York, on the outskirts of New York City, several demonstrations of co-ordinated community services to homebound patients are under way. One such project is centered at Grasslands Hospital, a County Welfare Department institution. This program is defined as one in which selected hospital patients, confined to home by illness, are provided with a full range of medical and related services arranged for by one administrative agency. This represents an extension into the home of hospital facilities along with other indicated services. The staff consists of a medical director, a public health nurse co-ordinator, and a case worker. Services offered by the hospital are available to the patient in his home through community agencies which provide the necessary personnel. These include consultants to the nursing agencies and trained workers who give direct service to the patient and family members responsible for his care, such as the following:

Public health nurses (County Health Department and voluntary nursing organizations)
Social workers (Home Care staff and department of family and child welfare in local areas)
Physiatrist (hospital staff and consultant on County Health Department staff)
Physical therapists (County Health Department)
Nutrition consultant (County Health Department)
Mental health nurse consultant (County Health Department)
Trained volunteers—"Special Therapeutic Services" including Friendly Visitors (hospital volunteer department)
Psychiatrist (consultant from hospital, psychiatric division)
Speech therapist (from a community speech clinic)

In addition, housekeeping services, transportation, laboratory services, and hospital equipment are provided by the hospital and various agencies.

Selection of the patient for the Home Care Program included acceptance of the plan by the physician in the community who will care for him upon discharge from the hospital. The therapeutic dietitian is notified by the Home Care office so that a diet history can be obtained by her or by one of the dietetic interns under her supervision. If a modified diet has been prescribed, it is planned with consideration of pertinent information about the patient's eating habits and other factors obtained from the history. Instruction is given usually to the patient and a family member. Copies of the diet and the history are sent to the nursing agency to whom the patient is referred for skilled nursing care at home. Community agencies and hospital personnel are notified of cases to be presented at weekly team conferences. This provides an opportunity for exchange of information pertinent to each case, resulting in continuity of care. Consultants attend these conferences regularly.

The public health nutritionist serves as a consultant to the public health nurses in the official and voluntary agencies. Case conferences in the nursing offices serve to clarify questions the nurses may have concerning follow-up instruction on dietary matters by the nurse in the patient's home, since this is a part of her nursing responsibilities. If the patient has been discharged from the hospital without a conference with the dietitian, the public health nurse and the nutritionist work together to fill this gap. If the dietary problem is complicated, the nutritionist may make a home visit with the nurse.

In addition to the procedure outlined, the dietitian and nutritionist informally share information and confer with each other, as they do on cases other than those selected for the Home Care Program. In fact, this demonstration serves to strengthen the nutrition education program which the dietary department of Grasslands Hospital and the nutrition office of the Westchester County Health Department have been sharing for the past four years.

COLLEGE CLUBS

Family Life Research

Mildred Thurow Tate

Dr. Tate is former head of the home economics department of Virginia Polytechnic Institute. She now lives in Blacksburg, Virginia, and is engaged in writing, counseling, and teaching.

ARE alert young people with inquiring minds looking for careers? Are they interested in searching out new facts or testing accepted points of view about family living? If they are motivated toward helping individuals and families live more abundant and creative lives, their career choice should be family life research in home economics.

The purpose of all research is to provide new knowledge. Family life research aims to discover *new truths or principles* which will *improve homes and the well-being of families.* It is the responsibility of home economists to make available the facts upon which families can make decisions about themselves and their way of living. In other words, family life research is the *systematic search* for facts or principles that will contribute directly to the provision of good homes, the maintenance of the physical and mental health of family members, and the development of constructive and pleasant human relationships.

The laboratories of family life researchers do not resemble the chemistry, foods, or textile laboratories. There are no chemicals, test tubes, or microscopes around. The subjects are people—children, teen-agers, and adults living in homes, attending schools, or engaging in community activities. The researchers study them at work and at play, when happy and when in trouble, when developing normally and when ill, to understand more fully what makes for success in family living and the results of different ways of living.

Questions to Be Answered

When doing research, one seeks to find or to contribute to the eventual finding of answers to questions about people, things, or situations. Home economists in family life research are seeking answers to many questions about family living. These questions cover a wide range, but most of them fall into five areas: those concerned with (1) homemakers and homemaking, (2) family-living activities, (3) the physical environment of the family, (4) socioeconomic conditions of the family in the community, and (5) relationships between family members. What are some of the answers which home economists in family life research are seeking? Scientific information on family living in the United States is still very limited. Many questions remain unanswered.

Some of the questions in the fields mentioned might be as follows: How competent a job are the homemakers in the United States doing? What problems do they have which home economists should be helping them meet? How well trained are they for the many activities which they are called upon to perform? Are they satisfied with their roles as homemakers, and if not, why not? What are the advantages and disadvantages of the homemaker's becoming a wage earner? Which role does the homemaker feel most qualified to perform—that of being a wife, a mother, a housekeeper, a citizen, or a wage earner? What training is necessary to help her perform all of these well?

What are the various ways used in American families for meeting the needs of small children, older children, teen-agers, husbands and wives, and the aged? Which ones are producing the best results and why? Are the better ways influenced by socioeconomic conditions, amount and type of education of parents, or by where the family lives? How do families arrive at their decisions within the family? Do some methods of making decisions develop people more capable of functioning well in the community than other methods? How do parents and children behave toward each other in different families? Are some of these behavior patterns superior to others in helping children grow into well-adjusted adults?

Family life researchers always are interested in where and how the family lives. As yet they cannot tell you whether the big house is better for family life than the small one; whether the house with all of the modern gadgets and equipment produces better families than that with limited facilities. These and many other questions will have to be answered by research.

Socioeconomic conditions pose many questions for family life research. What are optimum socioeconomic conditions for family living? Are war, inflation, community conflict, poor schools, emotional movies and television programs, and frequent moving more detrimental to some families than to others? If so, why, and what can be done about it?

One could go on indefinitely listing unanswered questions in family living which are waiting for dedicated home economists to supply the information. Family life researchers can take comfort in the knowledge that no field of work excels theirs in importance to the nation.

Training for Research

Those who would do research in any field of home economics, and especially in family life, must have a well-rounded background in home economics. They must be able to see the over-all picture of the home and the interrelations of problems of family life. Likewise, they must know the tools of research. These include mathematics, statistics, research methods, laboratory procedures, record keeping, and report writing.

Researchers in family life will also emphasize the social and biological sciences in their training. They must be thoroughly grounded in child development, psychology, family economics, sociology, family relations, marriage, and all aspects of interpersonal relationships. In addition, some knowledge of family law and anthropology would be helpful.

Personal Characteristics

Good training for research is necessary, but equally important are the personal qualities of the individual. Keen intellectual inquisitiveness is perhaps the first prerequisite of a scientist. Patience, accuracy, preciseness, dependability, and meticulous care in the way one works are very important. Would-be researchers in family life must be alert to everyday problems and have an interest in helping others. They must be able to share ideas and findings with others, for one successful piece of work becomes the steppingstone to the next. Ability to co-operate with others is essential, for rarely are scientific discoveries made by lone workers.

After the research is completed, research workers must be able to present the findings in a form which others can understand. This usually requires some ability to write for scientific journals as well as lay publications.

Employment Opportunities

There are many levels of employment in the family life research field. These positions require varying degrees of responsibility and training. Those with bachelor's degrees usually find jobs at the technical level or as an assistant to an established worker. If located in a university, the assistant may be permitted to take graduate work. After several years of experience or with a master's degree, the capable person usually can have more freedom in planning and carrying out a research project. To do independent research, one must have a doctor's degree or have exhibited outstanding ability through experience.

Those who are engaged in family life research may work in a university, in government service, in industry, or for a foundation. The worker may be giving full time to research activities or may be combining teaching and research, extension and research, or all three.

Advantages

There are many advantages to research as a profession. Qualified persons usually find great satisfaction in being able to observe, experiment with, and try out new ideas. Seldom is the pressure on research workers as great as that found in many fields. They may spend long hours, but these result from interest in following an idea through to completion.

Research is respected by one's associates and gives a position of status. Salaries are similar to those of other professional work requiring comparable training and background. Scientific investigators seldom amass great wealth and rarely achieve widespread fame and recognition. Yet, research brings its rewards. Researchers often are authorities in their fields of specialization and thus command prestige within their own circle. They have the opportunity to adventure and share with other scientists the thrills of new discoveries. This gives a feeling of belonging not always found in other professions.

My Job and Yours

Under this heading, as regularly as possible, the JOURNAL *plans to publish stories about home economics positions. These will include descriptions of new jobs or of new activities in established positions that reflect the scope and variety of today's opportunities in home economics. The* JOURNAL *will welcome contributions for this column.*

Clipping Service Idea Becomes New Home Economics Business

Submitted by the District of Columbia JOURNAL *news editor, Mrs. Faith M. Churchill.*

"You never know when a chance remark will become an idea and even develop into a new business," says Alice Brueck, manager of the Home Economics Reading Service in Washington, D. C. She contends also that home economics offers opportunities for jobs not yet even in the "chance remark" stage.

Her "opportunity" grew out of a conversation with her sister, Mrs. Carol Best, home economics director of the National Association of Frozen Food Packers. On an October evening in 1957 Mrs. Best felt frustrated in developing a report for her board of directors. The scarcity of clippings to demonstrate the effectiveness of her work troubled her. She was sure that more had appeared in print than the clipping service had identified and clipped. It was then that Miss Brueck conceived the idea of a specialized clipping service for home economics publicity writers.

Her first problem was how to get enough clients to pay for subscriptions to more than 700 newspapers. She consulted the directory of the Home Economists in Business section of the American Home Economics Association. She found names of 300 organizations she was *sure* would need such a service if it were established. In addition, there were many public relations firms and advertising agencies sending out women's interests publicity.

She asked questions of every home economist she saw. What kind of clipping service were they using? Was it meeting their needs? At last, she was convinced that there was definitely a need for the Home Economics Reading Service.

Next step—to find out how a clipping service operates. In the public library she found two articles in popular magazines of the 20's and 30's that told amusing incidents about items missent to clipping bureau clients. Only one book gave any description of the mechanics involved in reading 700-odd newspapers: This was *A Tree Grows in Brooklyn*. There Betty Smith described the factory-like routine of a clipping bureau at the time of the First World War—an example of what not to do.

Next, she visited a modern clipping bureau. Although the manager thought she was wasting her time to concentrate on the women's pages, he welcomed her visits to observe his service in action.

How do you start a business? How do you make sure that your idea is not taken over by someone else? She talked to the Small Business Administration and read everything from the United States Department of Commerce on starting a business. Next, she found a lawyer experienced in advising business, large and small. The lawyer said, "You protect your idea by using it before anyone else gets it. There is no patent or copyright that covers an idea." He explained licenses and contracts fair to herself and clients. Amazingly, capital for such a business was not hard to find.

Next step—promotion letters, hundreds of them, to a list of hand-picked clients, and an advertisement in a widely read trade paper. Then—a post office box, office space, and second-hand furniture.

She decided to hire part-time workers—homemakers whose children were in school—to read for her. They were selected for their intelligence and interest in reading about homemaking and were trained to recognize food articles by the way the recipes were written, by the ingredients, by the style of photograph—going further than searching for brand names and company names.

The office was opened officially April 1, 1958. With the office "manned," she went about making calls and spent several days on Madison Avenue in New York talking to prospective clients. Business came in, but it was no avalanche and there were moments of discouragement.

She says she will never forget those first clients who gave her courage a boost by inserting a few words of praise in their letters of instruction and the later satisfaction of having "old clients" renew contracts.

At the urging of some public relations experts who write publicity on home furnishings, fashions, and cosmetics, as well as on foods, she is now expanding into these fields as well.

Miss Brueck feels especially happy at creating something brand new in home economics that serves home economists. She gives full credit to her training and experience as a home economist in the development of her business. The idea itself grew out of a home economist's need. And her varied experience in the practice of her profession fitted her for the executive responsibility involved in making her dream come true.

AHEA Activities

Conference on 1958 Amendment to Federal Food and Drug Act

FAITH FENTON
New York State College of Home Economics at Cornell University

A conference to discuss the 1958 Amendment to the Federal Food, Drug, and Cosmetic Act, held in Washington, D. C., November 24 and 25, was co-sponsored by the Food and Drug Administration and the Food Law Institute, Inc., for a "due understanding" of the Amendment.

Most of the conferees were from industry and government with legal personnel represented. Women's organizations represented included the American Association of University Women, American Dietetic Association, American Home Economics Association, and General Federation of Women's Clubs.

The law was of necessity a compromise, but it is a good law. The importance of understanding of each other by the FDA, industry, and consumers was stressed. "The scientific significance of the Amendment will not be known for several years because we must wait for the unfoldment of the pattern of human behavior."

The label which must, except in few instances, list ingredients should be such that it dispels fear. Common names for chemical additives should have a pronunciation easy and obvious, have reasonable freedom from conflict with existing names, be applicable to use, and be brief.

Anyone may make suggestions for changes, additions, or deletions to proposed regulations released by the FDA. These include 118 food chemicals which are believed by FDA to be safe for intended use. Thirty-six of the 118 are limited as to quantity or foods in which used. Flavorings will be listed later. Coal-tar colors were omitted; they are subject to different provisions of the Act.

Before FDA permits an additive, it will consider consumption of all foods containing it. No additive may be used if it can be shown to cause cancer.

FDA "recognizes that a product fed to animals may be a drug or a new drug and may become a food additive if the effect is to produce meat, milk, or eggs containing components derived from the additive used in the feed."

FDA is responsible for food additives from packages and for any source of radiation in foods.

A petition for a food additive regulation must include a complete history of material, composition, source, stability, proposed quantity and method of use, control procedures, tests to determine amount of additive in the finished food or of any substance formed because of its use, and reports of animal or other biological experiments to determine safety of the additive. Both the petition and later the regulation will be published in the *Federal Register*.

Organization Leaders Discuss Social Security Programs

GERTRUDE LOTWIN
Department of Institutions and Agencies Trenton, New Jersey

Miss Lotwin, vice-chairman of the social welfare and public health section of the American Home Economics Association, represented the Association at the meeting she reports here.

There are numerous voluntary organizations whose purposes, programs, and areas of interest are closely allied to the Social Security programs. Secretary Flemming of the U. S. Department of Health, Education, and Welfare, cognizant of these mutual interests, called a meeting of approximately 114 such voluntary organizations in December 1958. The purpose of this meeting was to develop closer relations between interested citizen groups and governmental agencies through discussions, suggestions, and exchange of ideas.

The problems discussed were varied and numerous. A few of the suggestions are mentioned here.

Recognizing the fact that we live in a mobile society, delegates expressed a major concern as to the effect of local and state residence laws on individuals and families. There were strong recommendations that the Department give emphasis to this problem. Akin to this problem was the suggestion that the Department give consideration to the establishment of a fifth categorical assistance program to replace the general or municipal assistance programs.

There was an expression of concern regarding the number of farm laborers who are not covered by social security. There was a recommendation that the Department define the standards and economic level of a needy person or family. It was suggested that this definition could be used as a guide by state public assistance agencies.

The question was raised as to what thinking is being given by the Department to the problem of financing payment for the cost of medical services

rendered to public assistance recipients and to the medically indigent.

Further questions were related to the inequitable and inadequate public assistance grants in some areas of the United States and the resulting detrimental effect on needy individuals.

It was suggested that consideration be given to a plan for a simple explanation and description of the Social Security program and that this be made readily and easily available for all citizens.

All suggestions made at the meeting were recorded. These will be studied by the Department of Health, Education, and Welfare. A report including the Department's reactions and recommendations to the suggestions and what the Department has done with the suggestions will be sent to each organization.

Edison Foundation Presents National Mass Media Awards

MARTHA KELLY
Field Home Economist
General Foods Kitchens
White Plains, N. Y.

The Fourth Annual National Mass Media Awards Dinner given by the Thomas Alva Edison Foundation was held at the Waldorf-Astoria in New York City on December 1. Awards were made for films, television, and radio as follows:

The Best Children's Film—*Old Yeller* (Walt Disney)

The Best Science Film for Youth—*White Wilderness* (Walt Disney)

The Film Best Serving the National Interest—*The Old Man and The Sea* (Warner Bros.)

The Television Program Best Portraying America—*The Twentieth Century* (CBS)

The Best Science Television Program for Youth—*Conquest* (CBS)

The Best Children's Television Program—*New York Philharmonic Young People's Concerts* (CBS)

The Television Station that Best Served Youth—*Station WQED-TV*, Pittsburgh, Pennsylvania

The Radio Station that Best Served Youth—*Station WFMT*, Chicago, Illinois

Special Citations:

Continental Classroom (NBC)

Washington County Closed-Circuit Television Project, Hagerstown, Maryland

The World of the Mind, Broadcast Music, Inc., in co-operation with the American Association for the Advancement of Science and the American Council of Learned Societies.

The presentations were made by Paul J. Christiansen, president of the Thomas A. Edison Industries, Inc., and trustee of the Thomas Alva Edison Foundation.

It was a very enjoyable evening. I was particularly impressed with the emphasis placed on programs for youth. It occurred to me that we might "take a leaf from their book" and pay tribute during our own annual meeting to those who do a fine job of career guidance in working with young people.

Other interesting high lights of the program were addresses by O. Meredith Wilson, president of the University of Oregon and chairman of the American Council on Education, and by Harvey S. Firestone, Jr., chairman of the Firestone Tire and Rubber Company and trustee of the Thomas Alva Edison Foundation. Dr. Wilson considered the problems of education and communication under the title "But We Are Prologue Too!" Mr. Firestone's topic was "Science and Freedom."

In warning against complacency that might result from dwelling on our past achievements, Dr. Wilson urged that the nation show willingness to make the adjustments necessary to educate our youth for the rapidly changing world in which they must live. Cautioning against too much stress on the particular at the expense of general education, he said:

> Our faith in the individual has been the source of our difference and our strength. We first learned that of all our resources, the human resource is most important, and that the way to exploit that resource for greatest profit to society is through education. We have not only trained men for vocations but have tried to educate them generally, as the best and only hope of a free society. Because of the perceptiveness of men like Madison we have avoided making popular government a prologue to both farce and tragedy by investing generally in the minds of men.
>
> But today we are faced with new difficulties, and if out of national conceit we spend our time in self-congratulation *we* will be prologue to catastrophe. . . . We now require audacity in education of the same caliber as our audacity in business. Obsolescence must be as ruthlessly plowed under in education as in buildings on Park Avenue. Without new adaptations or inventions, quality of education must decline, for our supply of qualified teachers in college is soon to be in shorter supply than it has been in secondary education.

Recognizing television as one of the inventions that may assist in furthering education and communication, Dr. Wilson urged those concerned with it to make it a means of furthering communication "with" rather than just communication "to." Otherwise, it "will be limited to the transmission of facts, which is the least significant of all that takes place in the pursuit of understanding."

Executive Committee Holds Midyear Meeting

The executive committee of the American Home Economics Association held its regular midyear meeting at Association headquarters in Washington, D. C., January 16 to 18, 1959. Among the items on the agenda were review of plans for the annual meeting in Milwaukee, plans for observances of the Association's 50th Anniversary, reports from the Association's public relations committee, the philosophy and objectives committee, the committee on federal research related to home economics, and other continuing and new business.

The midyear meeting was preceded by the official opening of the 50th Anniversary Year—a dinner in Washington honoring representatives of government agencies, national organizations, and educational institutions whose programs include home economics.

Home economics "pioneers," Association charter members, are to be among those honored at the Anniversary luncheon during the annual meeting.

High Lights of Section Reports

Activities being conducted by the Association's subject-matter and professional sections were reported to the executive committee by Margaret Brew, chairman of the family economics–home management section, who represents the section chairmen on the executive committee. High lights of section activities include:

The *colleges and universities* section is planning to hold a workshop to study the problems of small college departments of home economics. It will be held in Milwaukee, June 15 to 19. For information, write to Dr. Marjorie East, Pennsylvania State University, University Park.

The *Extension Service* department is completing a recruitment folder designed to interest high school girls in home economics extension as a career.

The *home economists in business* have sent out four issues of their national Newsletter and report many active committees of the section.

The *home economics in institution administration* section is promoting state workshops or institutes on Food Service Management in Children's Institutions. Materials that would be helpful to persons planning such workshops were prepared by Mrs. Jean Seckinger and Mrs. Eloise Eckler and sent out during the fall.

Home economists in homemaking have distributed a newsletter to 1700 members of homemaking groups and had a committee to study and report on the tentative statement prepared by the philosophy and objectives committee. Fifty groups have expressed their willingness to serve as hostesses for visitors from overseas who are in the United States under the sponsorship of the International Educational Service of the Department of State.

The *research* section has as one of its major projects for the AHEA anniversary year a series of JOURNAL articles covering development and major trends in the various areas of home economics research. The section is also promoting advanced study.

The *social welfare and public health* section is planning a one-day workshop on rehabilitation of the physically handicapped to precede the annual meeting of AHEA in June.

The section has appointed a subcommittee on Homemaker Service to determine the number of professionally trained home economists involved in Homemaker Service programs and their functions, to interpret the role of the home economist in Homemaker Services, and to promote the use of the professional home economist in Homemaker Service programs.

The *family economics–home management* section prepared a report covering reactions to the tentative statement of the philosophy and objectives committee, revised suggestions to state chairmen of family economics–home management sections, and is preparing a supplement to the 1958 Directory of Professional Workers in Family Economics–Home Management.

The *family relations and child development* section reports that state chairmen of family relations and child development have been asked to begin work on fact-finding on the subject of legislation for protection of children. Some have already made reports for their states.

The *food and nutrition* section reports that the terminology committee is reviewing the Handbook of Food Preparation for any revisions that should be made in the next printing. The food fads committee has been active, and section members are encouraging publicity for the 50th Anniversary of AHEA. A TV program on the anniversary was given over the Oregon State College TV station on January 7.

The *textiles and clothing* section is continuing work on a textile handbook compiled by a section committee headed by Mrs. Dorothy Lyle.

AHEA Public Relations Program Reaches Libraries, TV, Other Media

In an *AHEA Public Relations Newsletter*, sent to state officers and public relations committees in January, the AHEA's public relations counsel reported a story carried by one of the large wire services, distribution of AHEA's "For You—a Double Future in Home Economics" to libraries in major cities, co-operation with National Television Week, and distribution and use of a radio script featuring information on careers in home economics.

In addition to the members of the AHEA public relations policy committee who review materials before they are released, other Association members have co-operated in the public relations program through radio or TV appearances, interviews, or through providing materials that the public relations counsel can use in informing the public.

USDA Advisory Group Suggests Home Economics Research

Stress on research to improve the testing of clothing and textiles for serviceability and performance was advocated by the U. S. Department of Agriculture's home economics research advisory committee at its annual meeting in Washington, December 8 to 10. The committee pointed out that improved laboratory testing methods, correlated more closely with actual wear and care data, would enable manufacturers and consumers to predict the actual performance of textile fabrics. In the field of textile and clothing research, the committee gave high priority to research that would determine the durability of new finishes that impart wrinkle-resistance, water repellancy, and other qualities.

In foods, the committee recognized a need for broader principles of food preparation, and, in nutrition, encouraged efforts to learn the role of fats in human nutrition and to gain new knowledge of carbohydrates and proteins.

Mrs. Dorothy S. Lyle, AHEA recording secretary, committee chairman, presided at the meeting. Mrs. Luise Addiss of New York was elected chairman.

U. S. Committee for the UN Sponsors United Nations Stamp Clubs

The United States Committee for the United Nations, in co-operation with Scholastic Magazines and the United Nations, is sponsoring United Nations Stamp Clubs across the country. Each branch club receives an information kit four times during the school year; club dues are 25 cents a year per individual member. The U. S. Committee announces that in 1958-59 each member will receive a free packet of Canadian stamps, an official membership card, an album page for UN stamps, and a subscription to the Globe-Trotter, the UNSC four-page bulletin. Interested youngsters should write to UN Stamp Clubs, Fourth Floor, 33 West 42d Street, New York 36, N. Y.

Georgia Association Offers Placement Service

The November 1958 issue of the *Georgia Home Economics News*, issued by the Georgia Home Economics Association, announced that the GHEA has inaugurated a professional placement service to be conducted through the public relations office of the state association.

Carol Lane Traffic Safety Awards Broaden 1959 Eligibility

The 1959 Carol Lane Awards for Traffic Safety programs in 1959 are being broadened so that entrants may compete on the basis of population. There will be three categories:

1. Groups and individuals in rural areas or in communities of less than 25,000 population
2. Groups and individuals in cities of more than 25,000
3. State-wide projects

First prize in each category will be a $1,000 savings bond and a bronze statuette. Second prize is a $500 bond, and a third prize is a $250 bond—each with a bas-relief plaque of the bronze figure. The awards are supported by a grant from the Shell Oil Company.

Entries for the 1959 awards must be submitted by June 15. For a descriptive brochure and entry blank, write to: Miss Alice C. Mills, Director, Women's Activities, National Safety Council, 425 North Michigan Avenue, Chicago 11, Illinois.

Nutrition Committee to Meet

During the annual meeting of AHEA in Milwaukee, nutrition committee members will meet at a breakfast on June 23 at the New YWCA. The program is being planned co-operatively by the Chicago Nutrition Committee, Illinois Nutrition Committee, and Interagency Committee on Nutrition Education and School Lunch. For further details, see the spring issue of *Nutrition News*.

Abstracts of Doctoral Theses Related to Home Economics, 1957-58

Following are abstracts of doctoral theses in home economics presented, in most cases, during the academic year 1957-58. The selection of abstracts was made mainly from titles of 1957-58 theses in home economics and related fields as compiled by the Institute of Home Economics of the Agricultural Research Service, U.S. Department of Agriculture, and the Home Economics Education Branch, Office of Education, U.S. Department of Health, Education, and Welfare. AHEA members included in the list were invited to submit abstracts. With each abstract is the title of the thesis, the name of the author, and the name of the college or university that awarded the degree. Some abstracts are not included here because longer articles or other uses of the material either have been made or are in preparation.

Education

An Appraisal Device for Teachers in the Elementary School: To Determine Opportunities for Learnings in Nutrition, FANNIE LEE BOYD, *Teachers College, Columbia University.*

The purpose of this study was the development of an instrument which would yield an indication of the type of learning opportunities in nutrition education which an elementary school teacher provides for the children in his classroom.

The first step in this study was to develop a framework for the construction of the instrument. This was done using categories of learning opportunities in nutrition education built upon: ideas gained from a review of the pertinent literature in the fields of elementary school curriculum and nutrition; observations in elementary schools; descriptions of teaching procedures provided by principals, supervisors, and teachers; and the experience of the investigator. These categories aided the investigator in identifying learning opportunities in nutrition education from which items for the instrument were developed.

The instrument was composed of four sections. Sections I, II, and III consisted of a series of items, and Section IV was an open-end question. In Section I, respondents checked the statements which described a procedure they used to determine the nutritional needs of children. In Section II, respondents indicated how often (frequently, occasionally, rarely, never) the practices listed were carried on in their classrooms. In Section III, respondents indicated whether or not the practices listed were carried on in their classrooms. In Section IV, respondents described a situation that occurred during the two weeks preceding the administration of the instrument in which they thought the children in their classrooms had a particularly effective nutrition education experience in school.

The instrument was administered to 176 teachers in six individual schools and two school systems. These schools were located in Georgia, New Jersey, and New York. Responses of 159 teachers provided the data for the study. A panel of six judges also responded to the instrument. The responses of these judges provided data for determining the scoring formula.

Using the results of data analysis of the four sections, comments made by respondents, and suggestions of the judges, the instrument was revised. Review of the data provided clues for combining the discriminating positive items to form only one descriptive account in Section I of the revised instrument. Section I of the original instrument was composed of three descriptive accounts. In Section II, the form of response was changed to a *Yes* and *No* response which was the same form used in Section III. Therefore, these two sections were combined. Some items which were either questioned by the judges or discriminated at too low a level were revised. Since only 50 per cent of the teachers responded to Section IV, the open-end question, this section was deleted in the revised instrument.

The investigator concluded that a teacher's response to the series of items included in Sections I, II, and III of the instrument yields an indication of the type of learning opportunities in nutrition education provided in elementary school classrooms. The investigator recommends that the revised instrument be further tested before it is made available for general use.

Informal Evaluation as a Teaching Technique for Some of the Less Tangible Aspects of a Homemaking Program at the Seventh and Eighth Grade Levels, HELEN L. CAWLEY, *Pennsylvania State University.*

This study was concerned with the development, refinement, and use of informal evaluation devices and techniques as teaching techniques in some of the less tangible aspects of a homemaking program at the seventh- and eighth-grade levels in two Buffalo city schools.

Nineteen informal evaluation devices were developed in terms of goals or subgoals considered less tangible by the homemaking teachers. The devices were checked by a group of educators to establish their validity and reliability.

Seventeen of the informal evaluation devices were used by two seventh-grade and two eighth-grade sec-

tions at Schools No. 19 and No. 82. One hundred and twenty-two girls, the regular homemaking teachers, and 23 junior participants from the home economics division, College for Teachers, Buffalo, were involved in this study.

Determination of the effectiveness of the instruments was based on statements made to the investigator by a sampling of pupils, observation, and opinions of the participating teachers.

The instruments developed in the areas of personal, family, and social relations were apparently the most effective teaching techniques used by pupils in this study. However, the instruments developed in the area of child development also rated highly as effective teaching techniques.

Generally, the teachers, junior participants from the college, and the pupils reacted favorably to all the devices.

This study indicates that:

1. A variety of meaningful informal evaluation instruments can be planned co-operatively and used as teaching techniques in some of the less tangible aspects of a seventh- and eighth-grade homemaking program.
2. Seventh- and eighth-grade homemaking teachers in the schools may be assisted in presenting some of the less tangible aspects of a homemaking program through the development and use of informal evaluation.
3. Informal evaluation instruments may be developed and used as teaching techniques in conjunction with the pre-service and in-service programs in home economics education at the seventh- and eighth-grade levels.

The Administrative Organization, Program Development and Personnel Policies of the Louisiana Cooperative Extension Service, MARTHA LOIS DUNLAP, *University of Wisconsin.*

The purpose of this study was to describe the administrative organization, program procedures, and the personnel policies of the Louisiana Cooperative Extension Service. Two case studies of the decision-making process were also a part of this research.

The Louisiana Cooperative Extension Service invited the National Agricultural Extension Center for Advanced Study to conduct a case study for the purpose of making an analysis of its administrative organization.

In designing the study, certain accepted principles of administration and organization were identified which it was felt should describe the functioning of a state extension service.

A team of three persons conducted personal interviews with 71 members of the Extension and University staff. The information obtained was summarized in the form of a descriptive case study. The following conclusions were drawn:

1. The staff of the Louisiana Cooperative Extension Service was organized in a hierarchical arrangement with vertical lines of authority and responsibility.
2. Levels and areas of authority and responsibility were, in general, clearly defined and understood by all personnel in the organization.
3. The span of control, in many areas, appeared to be too large for effective supervision.
4. Authority and responsibility were assigned on the basis of two major divisions: agriculture and home economics.
5. The Extension specialists were responsible to the director of Extension for subject-matter programs as well as for budgets and administration.
6. General policies and procedures have been developed for program planning to encourage participation by local people and professional staff, but such policies and procedures have not been generally followed.
7. The Service engages in numerous in-service training activities, but additional co-ordination and leadership are needed.
8. Supervisors evaluate the performance of personnel even though an objective system has not yet been developed.
9. The different levels of the organization were not generally represented in making decisions in the two case studies.

Participation of Older Members in 4-H Clubs in Selected Counties in South Dakota, MARY FRANCES LYLE, *University of Wisconsin.*

The purpose of this study was to determine whether certain factors associated with the local 4-H Club and the county 4-H organization influenced tenure of membership in local 4-H Clubs in South Dakota. All older boys and girls enrolled in and having been enrolled in a 4-H Club for a stated number of years in nine randomly selected counties were the subjects for the study.

All comparisons were made between mean scores of drop-outs and re-enrollees in four different groups of boys and girls divided according to years of club experience. Student's "t" was used as a test of significance for the five hypotheses, stated in null form, used in the study. Results indicated that it was necessary to reject the hypotheses for the majority of the groups studied.

The conclusions reached indicated that boys and girls continue to belong to those 4-H Clubs that:

1. Provide a variety of activities of which the members are aware at the regular meeting of the club
2. Have some type of club event in addition to the regular meetings of the club
3. Perform certain activities within the community or as a part of the county 4-H organization
4. Provide opportunities for member participation in such activities as demonstrations, judging, recreation, and the like at the regular meetings

and in which:

5. Members have something to do with the planning and execution of the program within the local club

6. Members know something about the county 4-H organization and have certain responsibilities in the planning and execution of the county program
7. Members have some leadership responsibilities, not only in local clubs but also in county organization

Satisfactions and Dissatisfactions of College Teachers of Home Economics, EVA LANICE MOORE, *The Pennsylvania State University.*

The shortage of qualified college teachers of home economics appears to be acute. The necessity of retaining and maintaining the faculty members already in the profession, as well as attracting capable students or teachers into the profession, is therefore emphasized. Teacher satisfaction may be one solution.

The study considered satisfaction with the position as a whole and then compared the relationship of the various aspects which seemed to be inherent in this whole. This included determining the factors which affect the satisfaction of college teachers of home economics. A questionnaire was prepared using three methods for determining job satisfaction: a self-appraisal of the teacher's present job satisfaction; "Yes," "No," and "?" questions; and a rating of life satisfactions. It was an attempt to measure more of the intangible factors related to job satisfaction than have been measured.

The satisfaction scores indicated that faculty members were generally satisfied with their positions. None of the teachers was highly dissatisfied with her (or his) position, according to the life satisfaction scores. However, 3 per cent of the respondents evaluated themselves as dissatisfied according to the self-appraisal technique.

Factors showing the greatest contrast between the desires of the teachers and the extent to which they found these desires in their positions follow: association with preschool children, opportunity for some travel, association in professional organizations with people from various parts of the country, association with close friends, association with people of the opposite sex, participation in public service, seeing improvement of physical facilities, seeing people happy and enjoying themselves, opportunity for new experiences, opportunity to center one's life around a home and family, and a feeling of doing one's best.

The factors which show the greatest similarity between what the teachers desired or disliked and what they actually found or did not find in their position or environment are listed: feeling of insecurity, being taken advantage of by others, having routine work, being in the hustle and bustle of large cities, being in large crowds, and having good food. An example of this similarity shows that those who disliked insecurity seldom found insecurity in the position.

Six selected comparisons were made among the various groups participating in the study. These comparisons were made on the bases of salary, the size of the institution, the size of the community, age, professional rank, and education. The total satisfaction scores were significantly higher among those with the highest salaries. It may be noted that 50 per cent of the teachers obtained income in addition to their regular salaries. The size of the community and the institution did not make any significant differences in satisfaction scores. The satisfaction scores tended to drop slightly among the 40- to 49-year-old age period. However, teachers in the 60 to 69 age group were significantly more satisfied with their positions than were those in the 20 to 29 age group in the over-all satisfaction score and in relationships with people. Academic rank appeared to be significant in the area of community and environmental conditions. Advanced education seemed to consistently increase the satisfaction scores of teachers with each level of advanced work. Satisfactions seemed to be interrelated, and, even though education or age proved to be significant, there are undoubtedly a number of factors which contribute to this satisfaction.

The hypothesis of the study was proved to be true: that job satisfaction is determined to a considerable extent by the presence or absence of factors which yield satisfaction or dissatisfaction in life.

Changes in Student Teachers Through Use of Pupil Ratings, MARJORIE LYON SAVAGE, *University of Illinois.*

The study dealt with a method of examining student-teacher effectiveness. Basic to the investigation was a belief that sensitivity to pupil reaction early in student teaching is desirable if a teacher is to perform effectively among adolescents.

The present investigation involved student teachers in home economics for the year 1956-57 at Purdue University and at Southern Illinois University.

The student teachers were assigned at random to an experimental or to a control group. Specifically, the major purpose was to identify differences in student-teacher behavior as perceived by pupils when those in the experimental group had access to their pupils' ratings as compared with those of student teachers in the control group who had no access to their pupils' ratings. According to the major hypothesis, if the student teachers have knowledge of how pupils rate them in comparison with conceived ideals, the behavior of the student teachers is likely to move in such a direction as to decrease the gap between the ideal and the real.

Prior to the development of the method, the investigator obtained from the free responses of 425 teenagers in home economics classes their concept of an ideal student teacher. These were later used in designing a rating scale by which to examine the amount and direction of change in pupils' ratings at the close of the first week of instruction and a second rating on the same scale at the close of the student teaching period.

One basic assumption was that a student teacher is interested in gaining an accurate appraisal of her pupils' concept of an "ideal" student teacher and of how they perceive their real student teacher in classroom situa-

tions. It was hypothesized that the student teacher's behavior is affected by her knowledge of her pupils' first ratings.

Another basic assumption was that pupils are better satisfied with their student teachers if the difference between ideal and real is slight than if the difference is great. Hence, the difference between ideal and real ratings for a given student teacher on each item of the scale is assumed to be a measure of pupil satisfaction.

Prior to the examination of the major hypothesis, comparison was made item by item between pre- and post-ideal mean ratings for student teachers in the experimental group and in the control group to determine whether or not the pre- and post-ratings were stable. The Pearson product-moment correlation technique was used for this analysis. Slight stability was obtained.

Comparison of the post-real-ratings for the experimental and for the control groups at Southern Illinois University and at Purdue University did not reveal any statistically significant differences. With the groups combined, comparison was made between the experimental and control groups to determine whether or not any change occurred between pre- and post-ratings. In the total group of 31 items, a statistically significant difference in favor of the hypothesis was found for three items. A definite trend was evident with respect to 23 of the 31 items for a greater change to occur in student-teacher behavior as perceived by pupils in the group in which teachers had access to information obtained by pupil ratings.

With respect to direction of change, there seemed to be a trend in favor of the group of student teachers which had access to pupil ratings.

An Evaluation of the Methods, Techniques, and Findings Used During a Six-Year Nutrition Education Program in a City School, EDNA RUTH SOSTMAN, Teachers College, Columbia University.

This study is an evaluation of a nutrition education program carried on for six years in an elementary school (P.S. 105) in the heart of the Spanish-speaking district of New York City. The effectiveness of the program was judged by (1) improvements in food habits of the children reported by means of questionnaires administered at intervals during the program and observations of the school-lunch program; (2) improved health evidenced by changes in appearance, growth, and general alertness, observed by teachers and by height-weight measurements taken at regular intervals during the six years; (3) changes in curriculum as reported by teachers and administrators resulting from in-service nutrition education courses.

The data showed that children who had been in classes which had participated in the Nutrition Education Research Program reported significantly better food intakes than others. The children who were in the school during at least three years of the program showed significantly greater gains in weight and grew more in height than children of similar backgrounds and ages attending other schools in New York City. Improvement in attitude and alertness was observed.

The teachers and administrators reported on the value of the in-service nutrition education courses and the nutrition consultant service. They considered the program valuable since nutrition could be correlated with other subjects, thus enriching the curriculum. Related activities provided means for making their teaching more interesting and effective.

Food and Nutrition

Physiological Response of Sprague-Dawley Immature Male Rats to Diets Containing Pea Beans Supplemented with Wheat, DL Methionine and L Lysine HCL, MARTHA E. PURDOM, *Ohio State University.*

A study was made on the major effects of whole wheat, 0.3 per cent DL methionine and 0.25 per cent L lysine HCL or a combination of these on weight gain, nitrogen retention, and deposition of nitrogen and lipids in the livers of growing rats using a 2 x 2 x 2 factorial design and controlled food intake. Dried whole egg (fat extracted) was used as the standard. The isocaloric experimental diets were fed to nine groups of six rats for a period of 28 days at which time they were sacrificed and the livers removed for analysis.

The findings indicated that egg protein was superior to the supplemented or unsupplemented legume (pea bean) protein for weight gain, nitrogen retention, and normal lipid and nitrogen deposition in the livers of young rats.

Supplementation of a pea bean diet with either methionine or wheat significantly increased weight gain, nitrogen retention, and hepatic tissue synthesis. However, wheat was not so effective as methionine in this respect. Lysine supplementation had a depressing effect unless methionine was present in the diet. These findings indicated that pea beans were primarily deficient in methionine, and lysine might have increased an imbalance of the existent partial deficiency.

There was little effect of methionine supplementation of a pea-bean-plus-wheat diet on growth and nitrogen retention. However, methionine plus lysine supplementation of a pea-bean-plus-wheat diet was slightly more effective than was methionine alone. This indicated that multiple amino acid deficiencies were present in the dietary proteins of a pea-bean-plus-wheat diet which methionine alone or methionine plus lysine did not eliminate. Furthermore, weight gains and nitrogen retentions did not run parallel, which indicated that nitrogen retention alone is not a critical index of weight gains.

The unsupplemented pea bean diet produced a slightly abnormal lipid deposition in the livers. This may indicate a borderline deficiency in the sulfur-containing amino acid methionine, which is needed for

lipotropic activity as well as growth. However, the results showed a normal percentage of total lipids and nitrogen in the livers of the majority of the rats, which indicated that the requirement of methionine for growth is somewhat higher than for maintaining a normal liver lipid.

Methods of Changing Food Habits and Concurrent Nutritional Status of Geriatric Subjects in a State Institution, FRANCES AGNES WILLIAMSON, *Texas Woman's University.*

This food and nutrition study included 103 geriatric subjects in a home for the aged. The investigation was one of a series of studies undertaken for the purpose of ascertaining whether or not patients of the geriatric age range could be improved in various aspects of their psychological and physical status by an improvement in their food intake.

This unit of the series covered the changes in food intake and biochemical tests on blood and urine during a six-months period. All of the subjects were fed in a special dining room, and an effort was made to encourage them to partake of the food made available to them.

One-half of the subjects constituted two experimental groups—for males and females, respectively—and one-half made up matched control groups. The variable which differentiated one pair of groups from the other was the addition of supplements to the food of the former in the nature of soya flour and grits, and brewers' yeast and wheat germ. The participants were not aware of the differences in the two diets.

Both groups increased markedly in the amount of food eaten. The increase in food consumption was believed to be related to group presentations on nutrition subjects and to individual interviews. The attitude of the subjects toward food was greatly improved as was the willingness to try new dishes and to consume all foods served. Patients who previously had shown little tendency to wait on themselves in the cafeteria line began to carry their own trays, and the morale in the dining room exhibited distinct improvement.

Many suggestions of possible interrelationships were found between the blood and urine tests and the food consumed.

Outstanding among the findings was the far greater increase in urinary excretion of thiamine and riboflavin by the experimental subjects, unquestionably related to the presence of these B-complex vitamins in the foods which served as supplements.

This is one in a series of studies conducted in the same institution, as noted, with the primary interest of the author to supervise the feeding program and to study methods of gaining the co-operation of geriatric subjects in better food habits.

It will remain for others to report upon hematology, soft tissue status, bone density status, response to functional tests, and response to psychology tests which have been administered during the same period as that covered by this report.

Housing and Household Equipment

Consumer Practices in the Buying and Use of Laundry Supplies and Equipment, BETTY JANE JOHNSTON, *Purdue University.*

Miss Johnston received the 1954-55 AHEA–Omicron Nu research fellowship award for study toward her degree. Part of the study was reported in the JOURNAL *for January 1958.*

The purpose of this study was to investigate the extent to which homemakers were aware of recommended laundry practices and the extent to which they followed them.

A list of desirable laundry practices was compiled from recommendations made in publications on laundry procedure. These were used as a basis for scoring homemakers on the way they did their laundry and on how they thought it should be done. The former is referred to as the practice score and the latter as the knowledge score.

When a "t" test for level of significance was used to test the difference between means, six factors were found to be significantly related to scores homemakers received on the laundry quiz. These were the type of washer, the investment in laundry equipment, the number of loads washed per week, the composition of the family, the number in the family, and the age of the homemaker.

The occupation of the head of the household, the education of the homemaker, her state of employment, and the number of products used in the wash-rinse water were not significant.

The factors related to practice scores were not discovered. Of the ten sorts used with the knowledge scores, only one variable, the investment in equipment, was significant. Possibly the women who had made a greater investment in equipment were those who had the greatest interest in the laundry task, and this interest was reflected in higher practice scores.

The knowledge homemakers had of desirable laundry procedures was more advanced than were their practices. When knowledge and practices were compared, the recommended laundry procedures fell into three groups: those which women thought were right and followed; those which women thought were right, but did not follow; and those which women did not recognize as being desirable. This would indicate a difference in teaching approach. The first group presents little problem. For the second group knowledge alone apparently will not change practices, but for the third group knowledge would be a first step in improving them. The correlation between what homemakers thought was right and their practices was 0.59. It would seem important that homemakers know correct procedures so that they do not follow undesirable ones believing they are right.

An Investigation of the Opinions of Some Metropolitan Homeowners in a Homogeneous Housing Development, Regarding Certain Features Present in Current Housing, RUTH A. LINKE, *New York University.*

This study deals with the housing preferences of a group of homeowners who live in a development of similar houses in the New York area. Their opinions were sought regarding certain features which were present in their houses and which are common to many other new homes. Interviews were held with 207 homeowners living in the 1950 semi-ranch style houses in Levittown, Long Island.

A rather consistent positive trend was found between satisfaction with the housing characteristics and desire for permanent residence.

Satisfactions and dissatisfactions with the various features found in the houses are discussed at length. Preferred changes are enumerated, and responses correlated with characteristics of the family and the house itself, for example, orientation, individualization, and upkeep.

The data tend to support the hypothesis that: "The degree of satisfaction which owners find in their homes is related to the family's personal characteristics, history, and social integration." Of these, personal characteristics showed the strongest influence upon housing satisfaction.

Several observations were made relative to the housing of families in the low- to middle-income groups. A one-story house was generally considered most desirable regardless of whether the family's own home had one or two stories. A minimum of three bedrooms was desired by the majority of all families with more than two members. The preferred laundry location was a first-floor utility room; second choice, the kitchen. Slab construction seemed to be very satisfactory when adequate closets and outdoor storage areas were provided.

Textiles and Clothing

An Investigation of the Relation Between the Kinetics of Dye Adsorption and the Fiber Properties of Cotton, NELL SKAGGS GLASSCOCK, *Texas Woman's University.*

Great interest has been shown in the synthesis of new dyes and the elucidation of chemical structure. The effects of dye concentration, salt concentration, and temperature on dye adsorption and equilibrium have been considerable.

The research problem described in this dissertation was undertaken to add to knowledge concerning certain interrelationships between the dyeing properties of cottons and the morphology of cotton fibers.

The specific objectives of the study were:

(a) To relate dyeing behavior of cotton to:
   1. Micronaire
   2. Zero gauge strength
   3. One-eighth inch gauge strength and elongation
   4. Maturity

(b) To attempt to relate the thermodynamics of dyeing to cotton fiber morphology as defined by the fiber properties

(c) To develop an equation which will define the adsorption of dye by cotton fibers

(d) To develop a quantitative relationship between one or more fiber properties and the rate of dyeing

A relation has been developed for the dye adsorption from the following equation:

$$k_1 t = (C_o - \underset{\infty}{C}) \ln \left(\frac{C_o - \underset{\infty}{C}}{C_t - \underset{\infty}{C}} \right) - (C_o - C_t)$$

The heat of reaction, $\triangle H$, and the energy of activation, $\triangle F$, were determined for some of the cotton investigated.

The following conclusions may be drawn from the study:

1. A definite relation appears to exist between the fineness of the cotton and the rate of dyeing.
2. For American Upland types, with the exception of Rowden cotton, fineness seems to be the determining factor. In other words, finer cottons have more surface area and a consequent faster rate of adsorption.
3. Equilibrium adsorption of dye by different cottons was found to be related to Micronaire.
4. A lower temperature proved to be advantageous.
5. A relation has been found which expresses mathematically the dye adsorption of cotton.

An Economic and Technological Study of Drapery and Curtain Textile Fabrics, LUCY LEONARD, *Texas Woman's University.*

The purpose of this study was to investigate the performance characteristics of drapery and curtain textile fabrics. The objectives were accomplished by three methods of approach, and they were reported in three consecutive parts.

Part I consisted of a survey of the types of draperies and curtains used in representative homes. The information compiled was based on data obtained from 200 homemakers. The information submitted by the homemakers included: style of draperies and curtains; fiber composition; fabric construction; color utilization; performance; and conditions of service, such as direction of exposure, types of air conditioning, type of fuel used in the homes, and the length of time the draperies and curtains had been in use in designated rooms, including living rooms, dining rooms, bedrooms, kitchens, bathrooms, dens, rumpus rooms, studies, and porches.

Part II covered a survey of the market, primarily to find the fiber content and the general construction of draperies and curtain fabrics offered during 1958.

Part III covered the detailed laboratory analysis of

representative drapery and curtain fabrics selected from those found on the current market in the section of the study reported in Part II.

The findings revealed the following: Some of the draperies included in the survey had been used 20 years. Some of the curtains had hung as long as 16 years. Others had been used for shorter periods of time, some for only a few weeks.

There was a wide range of prices of the draperies and curtains featured in the survey, and the 1958 prices ranged from 49 cents to $8 per yard.

Regarding trends in fiber content, the survey showed that cotton ranked first in use, with the other natural fibers in evidence among articles purchased several years ago. With each succeeding year, man-made textiles became progressively more common, with the types of man-made fibers increasing with time. In the 1958 market, cotton remained constant as the fiber in greatest evidence, with the synthetics and the blends next in popularity, and with other natural fibers assuming a very minor role.

The drapery fabrics most often reported in the survey were of heavy weight, often interlined as well as lined. Today's drapery fabrics are somewhat lighter in weight, more simple in pattern, and are often used without linings.

The only finishes mentioned in the early years were glazes and stiffening. Today's market finds special finishes used on drapery and curtain fabrics, giving them one or more of the following characteristics: spot resistance, water repellency, wrinkle resistance, and dimensional stability.

In the survey, the colorfastness trend was difficult to determine as there was no way of ascertaining how many draperies or curtains in the homes of the respondents had been discarded because of fading.

A large percentage of the fabrics tested gave good colorfastness results during laundering and excellent light colorfastness performance even up to and including 160 hours of exposure in the Fade-Ometer. Some fabrics which were tested faded in as little as 5 to 15 hours of Fade-Ometer exposure.

An Exploratory Study of Techniques for Determining Consumer Preferences in Children's Wear, Jo Stevenson Pahopin, *Ohio State University.*

An important need of research in clothing and textiles is the development and evaluation of techniques which reveal preferences that influence purchase behavior. A review of literature revealed that (1) interviews were the method most commonly used for obtaining preference data on clothing and textiles; (2) variations of techniques used to aid recall and related procedures used in interviewing would cause variation in the accuracy of response obtained; and (3) consumer research specialists generally accept observed purchase behavior as valid criteria for evaluating interview data. The purpose of this study was to evaluate the accuracy of four interview techniques for indicating point-of-sale preferences. The design proposed for achieving this purpose was to compare preferences obtained by each interview method with similar preferences obtained by observations of purchase.

Similar preference data concerning a standardized item of boy's wear, denim jeans, were collected by four variations of the interview method and by a representative sample of purchase observations. The only variable in the design was differences in socioeconomic characteristics of the population sample interviewed. Chi square tests revealed that these differences were not determiners of preferences for this standardized item of apparel.

Chi square tests, used to compare preference items obtained by each interview technique with similar preferences obtained from purchase observations, revealed that Method C, which used combined verbal and visual symbols to increase accuracy of recall and communication, was the most accurate technique for revealing preferences which influence the purchase of jeans. Method D, which used only probe questions on satisfactions (dissatisfactions) with wear and care performance, was less accurate than Method C but more accurate than Method B, which used a representative sample of market offerings of jeans as visual symbols to aid recall in obtaining response to probe questions. Method A, which used only visual techniques—observation as a garment was selected from a representative sample of market offerings—was the least accurate of the four interview techniques.

Conclusions drawn from findings were that probe questions increase the accuracy of response during interview and that combined verbal and visual techniques, used to support probe questions, provide greater accuracy than probe questions alone or probe questions supported only by visual materials.

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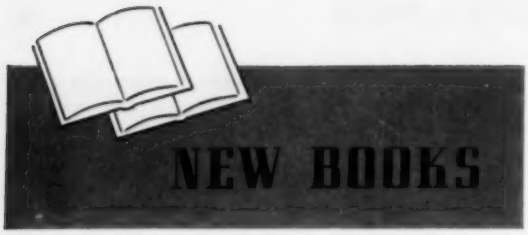
Proudly we report that as of February 1, 1959, AHEA had 24,579 individual members. Enjoy and refresh yourself, personally and professionally, by attending your state association's annual meeting. Let's keep interested and be members next year, too.



Human Potentialities. By GARDNER MURPHY. New York: Basic Books, Inc., 1958, 340 pp., $6.

The author, one of the leading psychologists of our day, has written a book which attacks a problem which has been creating increasing concern in the behavioral sciences. This problem, referred to by A. H. Maslow as "low ceiling psychology," is the tendency to concentrate upon man's immaturity rather than his vast potential for adjustment and fulfillment.

Dr. Murphy's knowledge of human limitations does not prevent him from envisioning a broader picture of man which includes consideration of his "sensitivity, modifiability, capacity to learn and adapt, adjust, and remake the world in the image of his needs." Fulfillment is seen to be possible because human nature is not determined solely by biological makeup and cultural conservatism which place limitations upon free will.

The author introduces a third concept of human nature—which is to be more fully understood through interdisciplinary study of the whole human being—that challenges many of our most cherished assumptions about human beings. Man is seen as one who yearns to extend beyond his limitations and his capacity to accomplish. This is seen in his ability to bring about relatively abrupt changes which seem to extend beyond the civilization from which they emerge in a surge of new ideas. The author notes that the expression of these new ideas in science and the arts is no longer limited to the elite. New forces favoring cultural inventiveness may be expected, therefore, which will oppose a disfunctional culture and provide, through a humanistic trend in science, a deeper understanding of the relationship between man and his environment.

This book will be widely read because it provides the reader with a fascinating array of seminal thoughts about human development and evolution growing out of the biological and social sciences. These thoughts often take the form of questions about human beings which must be answered if we are to realize our fullest human potential. Much of the importance of the book comes from this extension of the jurisdiction of science into areas of great importance which have often been ignored because they are difficult to approach with methods of inquiry presently available. This work moves away from scientific orthodoxy in order to pose important problems and thereby stimulate its readers in the development of the procedures required for their solution.—GEORGE T. FITZELLE, *University of California.*

Equipment in the Home. By FLORENCE EHRENKRANZ and LYDIA INMAN. New York: Harper & Brothers, Publishers, 1958, 308 pp., $6.

Both authors of this book are well qualified by their training and wide experience in college teaching and research to present the principles involved in the selection, care, and operation of appliances. The authors planned this book as a college textbook as well as a reference book for homemakers and professional people in the appliance industries.

The illustrations clarify the text throughout the book. Some of these are cutaway and cross sectional illustrations to help explain the principles involved in the operation of the equipment. The scale of some of the illustrations is larger than necessary, and some rather important illustrations have been omitted.

The technical electrical and nonelectrical terminology used in the equipment field is well defined and is simplified so that all readers should be able to apply this information to become wiser consumers. The equipment discussed is as up to date as possible in the field.

Experiments are suggested at the end of most of the chapters to assist the teacher with limited experience or limited equipment to improve her teaching techniques. Experiments are also included for the teacher with testing equipment.

Each chapter is divided into sections permitting discussion to be organized to fit the needs of the user.

The authors have included chapters on home wiring, lighting, and kitchen planning. The advantages and disadvantages of various materials used in equipment and surface finishes are discussed.

The book is well footnoted for quick reference to sources of information. These footnotes provide a reference list for the teacher or professional person.

The format of the book is somewhat different from that commonly used in textbooks. The dull paper used reduces glare.—LYLE MAMER, *University of Tennessee.*

Decision Making and Management for Farm and Home. By CARL C. MALONE and LUCILE HOLADAY MALONE. Ames, Iowa: Iowa State College Press, 1958, 255 pp., $3.95.

In *Decision Making and Management for Farm and Home,* the authors discuss in a simple, direct manner most of the theories on the subject accepted in the areas of home and farm management. The book was written "for farm families and those who counsel with them." In the area of farm management, especially, forms and charts to use for help-

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PLANNING AND SERVING YOUR MEALS

By MARY E. GOLDMANN, University of Texas. Second Edition. 265 pages, $3.75

A practical guide to efficient meal planning and service in the modern servantless home. Discusses food marketing, adequate diet, and the arts of carving and serving. Contents include meal planning, marketing, table setting, serving, forms of service, table decorations, invitations, special occasions, etc. Completely revised and updated.

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ing to show farm families the kinds of information they need for decision making and management are given. The forms and charts have undoubtedly been developed by the authors in their work on farm and home improvement programs as extension specialists in farm and home management. The book is pleasing in appearance, contains a good index, and, in addition to charts and tables, is illustrated with appropriate line drawings.

Since the processes of decision making and management are quite well known, the problem of authors of books on the subject, who wish to suggest action in these areas, is that of deciding upon a group of situations in which application of the processes can be discussed. With some special emphasis on young farm families, farm families' problems, their family and farming goals, and farming situations provide the base around which processes of decision making and management are examined in this book.

However, very often the greatest difficulty in such decision making and management is not the process but the correct appraisal of the value of resources at various times or at a given time, and the force or importance of different economic and social influences in the environment of any family or individual when decisions are made or management attempted. The book contains accounts of decisions regarding farm operations and how these have succeeded in the past. Some attention is given to varying use of resources on family farms and on different classes of farms. At one point, the authors report that the most nearly correct appraisal of the influence of a set of economic factors on prices could be obtained by taking a kind of average of the "optimistic" and "pessimistic" opinions held by a number of people on the subject.

Ultimately the value of a book on decision making and management, this one as any other, must rest on what it contributes to the ability of families or "those who counsel with them" correctly to make such appraisals.—Cleo Fitzsimmons, *Purdue University.*

Young Homemakers' Equipment Guide. By Louise J. Peet. Ames, Iowa: The Iowa State College Press, 1958, 245 pp., $2.95.

A text for secondary school teachers of home economics and young homemakers furnishing an apartment or their first home has been much needed. Louise Peet, head of the department of household equipment at Iowa State College for 22 years, is well qualified to write such a book.

In addition to equipment buying, the book discusses kitchen arrangement, motion and energy saving, kitchen safety, home heating, air conditioning, water systems, and basic facts about electricity, lighting, and gas. More than 130 photo illustrations show equipment construction and operation. How to do the family laundry is well covered with a good description of all kinds of cleaning agents. Mrs. Peet has included the relatively new electronic range.

A set of review questions completes each chapter, along with a large variety of experiments and projects which are suggestive of the problems that would be found in the home. These teaching aids would be valuable to the teacher with little equipment or, equally so, for one with a well-equipped laboratory.

The small appliances, saucepans, cutlery, and other kitchen necessities have not been omitted, although the section on materials, fabricating, and construction processes has been placed in the final chapter of the book. This makes the chapter on nonelectric housewares inadequate unless both chapters are studied at one time. In simplifying this text for high school students, the author has omitted some of the basic laws pertaining to efficiency in mechanical tools. It is difficult to write an equipment text where physics is not a prerequisite, but Mrs. Peet has explained most physical terms and phenomena in easy-to-understand language. Nevertheless, a high school course in physics would be helpful in understanding the construction of equipment, which is basic to its efficiency.

The young homemaker will find this equipment guide easy to read and to use. There are excellent subject-matter divisions and indexes to help the reader locate the desired materials. Reference lists suggest the names of other published information that is readily obtainable. This book attempts to supply basic knowledge about home equipment so that, as styles and models in equipment change, the homemaker is well informed on those features that mean quality, durability, and safety in performance. The care of all equipment is emphasized.—Rubye Macauley, *Ohio University, Athens.*

Gastronomique: A Cookbook for Gourmets. By Ida Bailey Allen. New York: Doubleday & Company, Inc., 1958, 384 pp., $4.95.

This book was written because of the increased interest in gourmet cooking throughout this country. It contains more than 1,000 recipes developed chiefly from the great European cuisine. They have been simplified, and the preparation time has been shortened for use in present-day American homes. A large proportion of the recipes call for foods available at any well-stocked supermarket. Trips to a specialty food store would be necessary to obtain some ingredients for a few delicacies. Much of the book has been written with inexperienced cooks in mind, and suggestions for garnishes, accompaniments, and serving dishes have been included.

The recipes themselves are mouth watering, but home economists will not agree with methods recommended for cooking and tenderizing meat, for hard cooking eggs, or with the author's state-

ments concerning poultry. Other procedures suggested for food preparation are of questionable value. Unfortunately, the author's most likely audience, the young homemaker just becoming interested in gourmet cooking, may be unprepared to evaluate these procedures for herself.

There is a glossary of culinary terms and a list of stores where specialty foods may be purchased. The format of the book is attractive with recipes arranged so that the ingredients are easily read.—GRACE BENNETT, *Purdue University.*

Clothing Selection: A Laboratory Manual. Revised Edition. By BETTY C. DELAVAN, AURELIA K. ADAMS, and LOUISE C. RICHARDS. Minneapolis, Minnesota: Burgess Publishing Company, 1958, 110 pp., $2.75.

This spiral-bound manual has laboratory activities for college students in an introductory, lecture-and-laboratory-type clothing selection class. The authors are present and former teachers at the Pennsylvania State University, where these laboratory activities proved to be of value.

The text is concisely written in a formal style and is not illustrated. The activities encourage students to exercise critical judgment. The objective and a fairly broad range of specific reading suggestions are listed for each activity. There appears to be adequate space provided for most fill-in responses.

"The Role of Clothing" encourages an informed awareness of clothing customs, practices and symbols, and fashion trends. Regrettably, these stimulating learning activities are too few. Documentation of references to research conclusions is lacking.

"Selection for the Individual" has many traditional activities for women students to determine complementary colors, lines, and textures. Little emphasis is given to general principles for recognizing good design and creating an attractive ensemble. The "personality analysis" activity might have been augmented with writings by authorities on psychology of personality, and the wardrobe planning activities could have been more definitive and realistic.

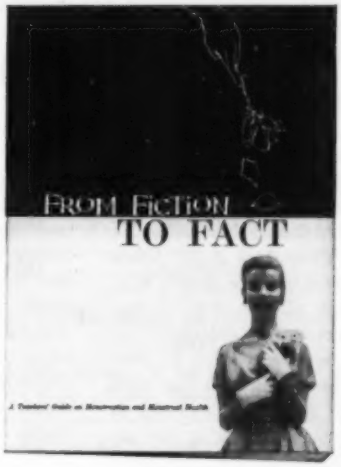
"Consumer Buying for the Family" includes experiences to aid in the recognition of common fabrics, quality features in certain ready-made clothes, and information and psychological appeals in advertisements and labels.

"Care of Clothing" emphasizes techniques in cleaning, storing, and repairing clothes and evaluation of storage equipment for the home.—FRANCES TACIONIS, *Syracuse University (New York).*

Modern Manners: Etiquette for All Occasions. By CAROLYN HAGNER SHAW. New York: E. P. Dutton & Company, Inc., 1958, 368 pp., $3.95.

The author is the publisher of *The Social List of Washington, D. C.*, and has a weekly column in the *Washington Star* entitled "Modern Manners."

New teaching guide on menstrual health



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NEWS NOTES

GENERAL

Iris Davenport, editor of the woman's department of *Farm and Ranch–Southern Agriculturist,* Nashville, Tennessee, and national president of Phi Upsilon Omicron, was married to Charles Alfred Mahan on November 29, 1958 in the Chapel of Saint Johns Baptist Church, Charlotte, North Carolina. Her new address is 1715 Bon Air Drive, Lexington, Kentucky.

Five home service women in electric utilities were presented the 1958 **Laura McCall Award** at a dinner in Chicago on January 7 during the national convention of the Electrical Women's Round Table, Inc. Mrs. Elizabeth Sweeney Herbert, former AHEA president, and the household equipment editor of *McCall's* magazine, sponsor of the award, presented a bronze plaque and $200 to each of the following: **Judith E. O'Flaherty** of the Philadelphia (Pennsylvania) Electric Company in recognition of the imagination and creative talents she displayed in developing a "Cooking Around the World" exhibit to promote the cooking versatility of automatic fry pans; **Mrs. Celeste M. Sullivan** of the Illinois Power Company, Decatur, for the effective way a new series of demonstration programs presented information related to the problems today's homemakers face in selecting and using home appliances; **Mrs. Mildred Ditzel** of the Dayton (Ohio) Power & Light Company for the "Magic of Light and Color" program she developed to show homemakers, sales personnel, and decorators when to use most effectively the new colored light bulbs now available; **Mrs. Marguerite G. Surles** of Carolina Power & Light Co., Raleigh, N. C., for a unique award program to appliance dealers who sponsor events that help homemakers know more about the advantages of the electric appliances they sell; and **Margaret Buchan** of Indiana & Michigan Electric Company, Ft. Wayne, Indiana, for the over-all excellence of programs given by her staff to youth and adult groups in the community.

INTERNATIONAL

Mae Baird, state leader in home economics extension at Kansas State College since 1954, has accepted a two-year assignment as a member of the India–Kansas State College team, under contract with the International Cooperation Administration. As the first home economist member of the team, directed by George Montgomery, head of the economics and sociology department at Kansas State College, Miss Baird will be at the Anand Agricultural Institute in Anand, India. She expected to reach New Delhi for orientation on February 1.

Boletha Frojen, former state supervisor of home economics education in Florida, former assistant supervisor in Arizona, and a former staff member of the University of Hawaii, Woman's College of the University of North Carolina, and the University of Nebraska, is at Ege University, Izmir, Turkey, for the academic year 1958-59 on a Fulbright grant as lecturer in home economics. Her special assignment is to plan a home economics department and curriculum at the University, which was established three years ago, but she is also doing some teaching. At the termination of this assignment, Miss Frojen expects to go to Hawaii to make her home with her sister, Olga Frojen of the University of Hawaii faculty.

STATE ACTIVITIES

ALASKA. Summer school sessions at the **University of Alaska** have been extended to include two sessions of four weeks each instead of the previous six-week courses. Courses begin June 15. Vena Clark, assistant professor of home economics, will teach weaving the first period and clothing construction by the Bishop method the second. Further information may be obtained from the Summer Session director.

Mary Frances Lamison has succeeded **Mary Morlan** as supervisor of vocational home economics and teacher of home management at the University. Miss Morlan resigned to be married.

Frances Scudder of the U. S. Federal Extension Service was guest speaker at a series of home demonstration achievement meetings held at Juneau, Seward, Anchorage, Palmer, and Fairbanks.

Edward Pope, child development and parent education specialist in the Federal Extension Service, was guest speaker at the Ninth Annual Short Course at the University of Alaska in October. Eighty-seven women attended.

KANSAS. Velma McGaugh, Douglas County home economics agent for the past year and a member of the Kansas Extension Service staff since 1943, is the new home economics supervisor in the 21 counties of the Southeast Extension District. Miss McGaugh joins the staff of five district home economics agents with headquarters at Kansas State College. These agents work with the county extension agents and executive committees of the county extension councils in planning the county home economics extension programs. For two years, beginning in September 1955, Miss McGaugh was an International Cooperation Administration home economics adviser in Pakistan.

MARYLAND. Mrs. Virgina Voigt Roeder, specialist in home economics in the Baltimore City Public Schools, is on leave for the 1958-59 school year to work on her PhD degree at the Johns Hopkins University, where she has been awarded a full tuition scholarship and the Pi Lambda Theta Fellowship. "Comparison of the School Achievement, Adjustment, and Attendance of Children of Gainfully Employed Mothers and Children of Full-time Homemakers" is the subject of her research.

Mrs. Jane Cole Elliott was appointed associate home demonstration agent in Montgomery County on February 1. Recently a teacher, she was formerly employed by the Maryland Extension Service as assistant home demonstration agent in Prince George's County for two years and later as home demonstration agent in Worcester County for five years. She succeeds Mrs. Mary P. Eaton, who resigned to join her husband in Florida.

MINNESOTA. Research projects under way at the **University of Minnesota** include the following, Louise A. Stedman reports:

In Home Economics Education:

1. *Homemaking teacher attitude studies* dealing with the attitudes of

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Four-Week Session—June 22-July 17

Proseminar on Family Financial Security Education.

FORUM—MODERN FACETS OF FOOD AND NUTRITION—JUNE 29-JULY 3

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For further information, write Frances Zuill, Associate Dean, School of Home Economics, University of Wisconsin, Madison 6.

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"in service" homemaking teachers. Attitudes under investigation are those toward pupils, the profession, home economics subject matter, communities, and co-workers and toward various types of family background. The research is supported in large part by a grant from the U. S. Office of Education.

2. *Blind homemakers,* a study focused on homemaking responsibilities accepted and rejected by visually handicapped women with attention to reasons for acceptance or rejection. The ways in which women learn to carry out certain responsibilities will also be examined. This study is financed in part by a grant from the state through the State Services for the Blind.

3. *Teaching procedure,* an exploratory study being carried on, in cooperation with the home economics section of the State Department of Education and North St. Paul schools, on the effectiveness of different procedures in teaching homemaking in a shortened period.

4. *Central regional study.* The University is continuing its participation in the Central Regional Cooperative study dealing with teacher attitudes and associated factors.

In Household Equipment:

1. *Home appliances,* a Graduate School project started this year on advantages and limitations of selected home appliances and selected features of home appliances.

2. *Built-in appliances,* a project of the Minnesota Agricultural Experiment Station dealing with built-in and electronic cooking appliances for home kitchens.

In Textiles and Clothing:

1. *Children's garments.* As part of the Cooperative Central Region clothing and textiles research program on consumption, characteristics, and serviceability of children's garments, Minnesota, in co-operation with South Dakota, has undertaken additional research on physical characteristics of denims composed of some of the newer fiber blends. Findings of these studies will be related to previous work on different weights of cotton denims.

2. *Blanket qualities.* As part of the Agricultural Experiment Station program, a study on blanket qualities is being made to determine relative properties of blankets varying in construction, weight, and fiber content.

In Family Relationships–Home Management:

1. *What kinds of experiences and home training do outstanding campus leaders seem to have?* The family relationships–home management section of the School of Home Economics has been studying 25 outstanding campus leaders during 1957-58. These young people were selected from recognized campus honorary organizations, such as Omicron Nu, Phi Upsilon Omicron, Student Council, and Chimes, as well as suggested by their peer groups and faculty representatives. Various tests, including a tape-recorded interview and analysis, were given these leaders. From these evaluations an objective test has been devised and administered to another group of leaders as well as a control group of juniors and seniors. Similarities and contrasts between the two groups will be studied.

The Ann Pillsbury home service center of the **Pillsbury Company** in Minneapolis has been reorganized,

Ruth Andre, the director, announces so that the top home economists of the center's staff of 48 home service experts now have the responsibility for all home service work on a specific group of products. **Mary Kimball** has been named head of the new-products group; **Marian Quire** is product head for the refrigerated products group; **Sylvia Ogren** is in charge of the flour group; **Barbara Thornton** now directs activities of the variety mixes group; **Mrs. Joan Boyce** is product group head for cake and frosting mixes; and **Rosemary Schaefer** is manager of the newly opened Junior Home Service Center, which sponsors the School Bake-Off and the Pillsbury Award programs.

Jennie Lee Ragan, a Louisiana State University graduate, has joined the General Mills staff as assistant supervisor of product counselors.

New staff members of the General Mills test kitchens include: **Jenelle Dow,** a University of Minnesota graduate; **Joanne Vosburg,** a Cornell University graduate; and **Cathy O'Hearn,** a Michigan State University graduate.

MISSISSIPPI. During the 1957-58 school year, a **school lunch study** was conducted in six Mississippi schools by the Mississippi School Lunch Program, nutritionists of the State Board of Health, and Dorothy Dickins of the Mississippi Agricultural Experiment Station to determine (1) the acceptance of certain foods by students, (2) the amount of food consumed by individual students, (3) the relationship of white milk versus chocolate milk on a child's total food intake, and (4) the relationship between midmorning food intake and noon food intake. The schools were selected from different sections of the state, and conditions were as nearly alike as possible.

The results of the study completed to date have shown that the consumption of white or chocolate milk served with the lunch was not a significant factor in the amount of food consumed by the child. The results of the other three factors under consideration have not been completed at this time.

MISSOURI. The home economics department at the **University of Missouri** now has 15 active research projects, including for the first time, a project in **child development.** In this, the emotional development of children is being studied with a view to helping establish age norms and determining how much variability there is in behavior among groups of children in different environments. This is designed primarily to help home agents, other professional workers, and parents who are interested in knowing what to expect of children of various ages.

The University has four research projects dealing with **marketing of meat and poultry** in which the departments of home economics, agricultural economics, animal husbandry, and poultry are co-operating. Panel studies under controlled conditions with experienced panel members are correlated with consumer and sales studies in towns and cities of Missouri. Study of preferences of consumers for different quality and cuts of beef is being continued and methods to recommend for preparing meat of different grade and cuts are being developed and standardized. Study of the palatability of poultry processed by different methods is being continued. A survey is also being made of the methods of buying meat and of home storage and preparation practices. At the same time, various handling practices in commercial channels are being studied. Following an analysis of results of this study, a study of the effect of certain specified commercial handling practices on the storage life of meat products in the home will be undertaken in the hope of developing recommendations for home storage and handling practices. A co-operative study with the Agricultural Research Service of the U. S. Department of Agriculture of household waste of meat and fat products is also planned.

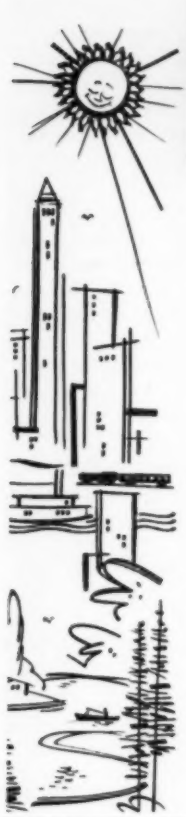
Nutrition research in progress includes the utilization of protein from vegetable sources and determining minimum levels of protein which are adequate for body maintenance on such protein. White bread is being made at varying levels of milk solids, with and without the addition of lysine, and will be analyzed for protein and lysine. It will also be analyzed for other amino acids if additional equipment is available. The nutritive value of poultry products prepared by new methods of processing is also being studied. These products are being analyzed for thiamin, riboflavin, lysine, and methionine, moisture, fat, and total nitrogen. Study is also being started on energy expenditure in metabolism and with different activities in animals as measured by a new gradient calorimeter, built in the agricultural engineering division.

Studies in the area of **food improvers** and **food preparation** as well as **tests of new flours** developed by the field crops department are being continued. Included are pancreatic and papain tenderizers, development of a formula for an all-purpose mix containing non-fat milk solids and standardizing recipes using the mix, and use of whole wheat in food preparation. In connection with research on baking properties of new wheats developed by the field crops division, dried egg albumen problems are being studied. A study of the effect of different levels of salt on the whipping ability and stability of both spray-dried and pan-dried albumen has been made. Included also are studies on the freezing of cakes and cookies using soft wheat flour and dried milk, preliminary studies on the suitability of various thickening agents for frozen products, and study of the chemical nature and behavior of strawberry pigment with a view to improving the stability of such products as strawberry jam.

Textiles and clothing research includes completion of serviceability studies of children's clothing and beginning a study of adolescent girls' preferences for clothing. A study on the effect of crease-resistant finishes on fabric is continuing. These studies are in co-operation with the North Central Region. The University is also co-operating with the Southern Region in studying the relation between fiber properties of cotton and the properties of the finished fabric. The cotton in this case is being experimentally milled and made into sheets to be tested for serviceability in the University dormitories.

Recent research not part of the University's Experiment Station research but done by graduate students in clothing includes a comparison of choice of wardrobes by girls at Stephens College and the University and a study of methods of fitting the princess style or the dress without a waistline seam for figures with various faults.

NEVADA. "Leisure Time" was chosen as the theme for the year by the Western Branch of the **Nevada Home Economics Association.** Topics and program chairmen for the four meetings are: "What Is Leisure



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Time?" Patricia A. Tripple, associate professor of home economics at the University of Nevada; "Leisure Time Services for Community and Church," Genevieve Pieretti, state supervisor of homemaking; "Leisure Time–Family Fun," Bee Mortenson, Pershing County High School homemaking teacher; "Leisure Time for Self-Improvement," Mrs. Elsie Colvin, Douglas County High School homemaking teacher.

NEW JERSEY. The Bergen-Passaic Section of the **New Jersey Home Economics Association** held an international panel discussion on "Wider Horizons in the Home" at its November meeting. The panelists were women who had worked, studied, and lived in the East and Near East. Mrs. Phyllis S. Waintraub, Bergen County home agent, who had taught in Zulu, South Africa, led the discussion. Members of the panel were Pilar Tanjuatzo of the Philippines, Suna Bayraktar of Turkey, and Mayboob Shazaman of Pakistan, all studying at Columbia University, and Marjory Wyborn, a professor at Teachers College, Columbia University, who taught in India during 1953-54 under a Fulbright grant.

Edna Sostman and **Miriam Brush** of Douglass College, Rutgers University, are continuing their co-operative nutrition research with M. J. Babcock of the College of Agriculture on the inter-relationships of protein and vitamin B_6. Eight students from the College again served for an eight-week diet study using a diet high in protein and low in vitamin B_6.

Gail Grimm, graduate assistant in food science at Douglass College, is working on the freezing of eggs and egg products, both raw and cooked.

Mrs. Hilda L. Watson, educational director of the American Hotel Association, is scheduled to speak at the New Jersey Vocational and Arts Convention in Asbury Park on March 20.

NEW YORK. The Christmas bazaar held at the National Arts Club by the New York City Home Economists in Business to raise money for the group's scholarship fund was most successful from both the social and financial points of view. Marian Laylin was chairman.

"Food Makes a Difference" will be the slogan of **New York Nutrition Week,** scheduled for May 3 to 10 with Mildred F. Englander as chairman. During this week, home economists and dietitians throughout the five boroughs of New York City will make a concentrated effort to reach as many people as possible with various types of nutrition programs. Mayor Wagner will officially proclaim Nutrition Week, and there will be demonstrations, speeches, movies, displays, and radio and TV appearances.

Dr. Sara Blackwell is the new head of the home economics education department of the New York State College of Home Economics at Cornell University. She succeeds Margaret Hutchins, retired. Dr. Blackwell joined the Cornell staff in 1948 as an assistant professor to develop the research program of the department of home economics education. She is chairman of the research section of the American Home Economics Association.

Emily J. Berckmann has joined the Charles W. Hoyt Company, Inc. of New York City to head a new

What Do You Read?

For information on home economics careers

Read the publications of the American Home Economics Association

Among them are:

Career Guides

A Career in Research Opens the Door to Better Living. 1957. Each area of research in home economics is described and illustrated. Describes opportunities, training needed.... $0.10

Career Opportunities in Home Economics in Business. 1954. Tells the scope of possibilities for the young girl preparing for this area of work. Describes the abilities and personal qualifications needed for jobs in advertising, editorial work, equipment and foods merchandising, fashion promotion, and so on. 20 pages... .35

For You—A Double Future in Home Economics. 1957. All major career areas in home economics are described in this gaily illustrated career booklet. Written for high school and college girls, but detailed enough for counselor's use. Single copies..... .25
Lots of 50 or more, 20 cents each.

Home Economics: A Guidance Aid. 1955. A brochure to provide high school guidance counselors and teachers with information on home economics. Graphic outlines present opportunities, personal requirements, necessary educational preparation, and sources of further information. Fits in filing case..... .25
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Home Economics Career Wheel. Revised 1954. Single copies free. Additional copies, 2 cents each.

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Size Up Home Economics. 1957. Appealingly illustrated folder gives high lights of opportunities in, and advantages of, home economics as a career. Single copies free. Additional copies three cents each.

Teach Home Economics—A Career with a Future. 1953. A two-color booklet which outlines the variety of opportunities awaiting the girl who prepares to teach home economics. 8 pages..... $0.20
Lots of 50 or more, 15 cents each.

Today's Challenge to Home Economists of the Extension Service. 1954. An illustrated leaflet outlining aims of Extension Service workers and ways they are carried out..... .05

Wanted: Home Economists with Advanced Degrees. Prepared by a committee of the research section to promote advanced study. Illustrated folder. 1956. Single copies .10
Lots of 50 or more, 5 cents each.

Reprints included in Career Packet:

Homemaking Counselor, An Emerging Career for Home Economists. HAWKINS, Nov. 1955..... .15

What Opportunities in Government? April 1956..... .10

Career Packet

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Please include your remittance with order for publications.

department of publicity and public relations. She had been associated with Theodore R. Sills & Company for 8 years and previously had been associate copy chief of *Good Housekeeping*, contest supervisor at *Family Circle*, and associate editor of *Everywoman's Magazine*.

OHIO. The calendar of the Cincinnati-Dayton HEIB group of the **Ohio Home Economics Association** includes regularly printed newsletters, white elephant sales for the benefit of its scholarship fund, wrapping Christmas gifts for "senior citizens," printing local directories of members, as well as its many educational meetings with outstanding speakers. The reports in the group's newsletters of interesting activities of its members and of the latest developments in equipment, textiles, apparel, and home furnishings help keep its members well informed. Reports from other HEIB groups give the Cincinnati-Dayton group new ideas and help its members evaluate their own activities.

OREGON. A "wearability" testing machine that subjects items of clothing and fabrics to a lifetime of wear in a few hours has been purchased by the **Oregon State College** School of Home Economics for research and teaching purposes. It is one of only about 20 such instruments in colleges across the country.

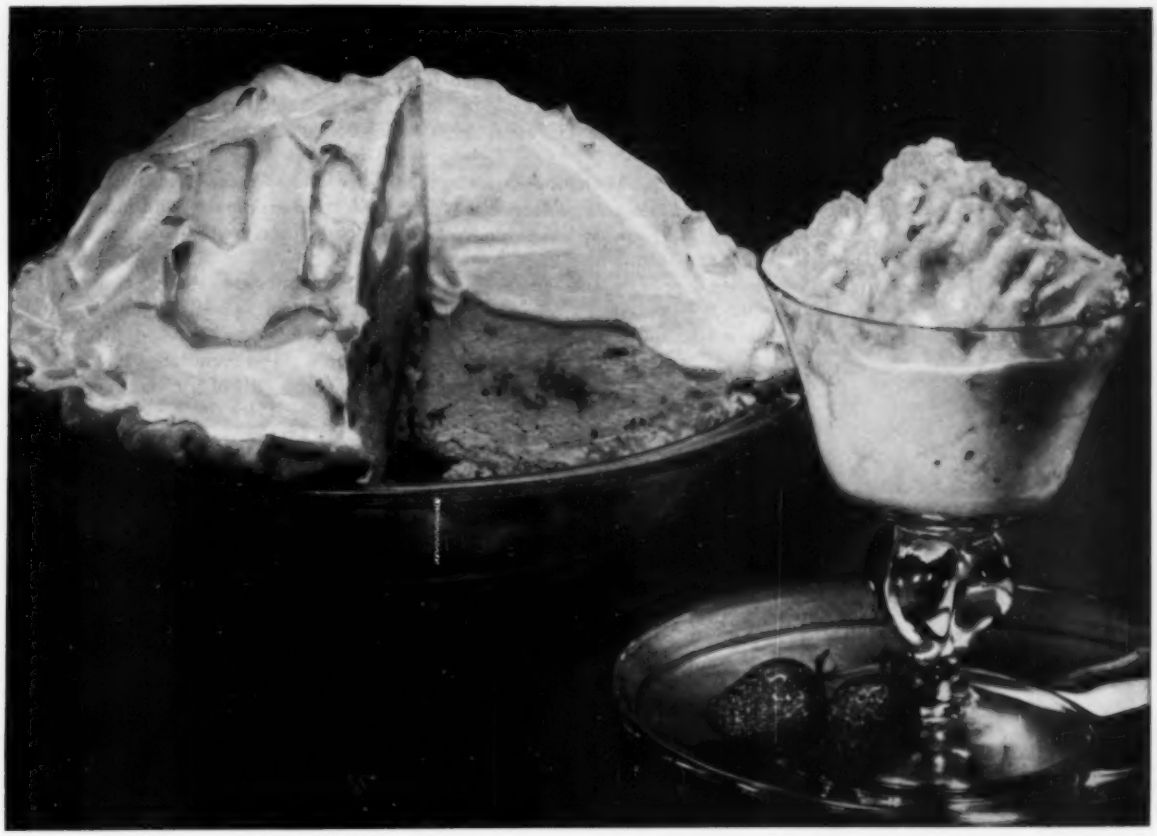
Called an Accelorotor, the machine has been used for a study comparing the "wear and tear" of upholstery fabrics and currently is being used for research on blankets made from wool and acrylic fibers.

Next year, the department of clothing, textiles, and related arts is planning a study of the wearability of cottons. Research findings will be published as projects are completed.

Research workers include Barbara Buckwalter, Florence Petzel, and Phyllis Grant.

RHODE ISLAND. "The International Situation" will be the subject discussed by David D. Warren of the department of history and political science of the University of Rhode Island at the annual joint meeting of the **Rhode Island Home Economics Association,** the R. I. Dietetic Association, and the R. I. Nutrition Council in March.

The College of Home Economics of the **University of Rhode Island** will celebrate the 50th Anniversary of Home Economics at the University on



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The secret of the success of these delicious frozen desserts is Karo® Syrup. Because light Karo Syrup makes the texture so smooth, adds deliciousness to the flavor, increases the body and the whipping properties of frozen desserts.

BAKED ALASKA PIE

4 eggs
1/4 cup sugar
1 cup KARO Syrup, Red Label
1 teaspoon vanilla
1 cup heavy cream, whipped
1 baked 9-inch pastry shell, chilled
3 egg whites
1/4 teaspoon cream of tartar

Beat eggs until foamy. Gradually add sugar, then 1/2 cup of the Karo Syrup; beat until thick. Stir in vanilla. Fold in whipped cream. Turn into freezing tray. Freeze until almost firm. Turn into chilled bowl; beat until smooth. Turn into pastry shell and freeze until firm. Just before serving, beat egg whites until frothy, add cream of tartar, beat until stiff peaks form. Gradually beat in remaining 1/2 cup Karo Syrup; beat until very stiff. Cover pie with meringue; seal edges. Place on several thicknesses of wrapping paper on a wet board. Bake in a very hot oven (500°F.) about 5 minutes. Serve immediately.

STRAWBERRY MOUSSE

2 10-oz. pkg. frozen strawberries
2/3 cup KARO Syrup, Red Label
1/3 cup sugar
1/3 cup water
3 egg whites
1 1/2 teaspoons vanilla
3 egg yolks
2 cups heavy cream, whipped

Thaw strawberries. Combine Karo Syrup, sugar and water in a saucepan. Bring to a boil, and boil 2 minutes. Beat egg whites until stiff but not dry. Gradually beat in hot syrup, continuing until mixture is thick and creamy. Add vanilla. Beat egg yolks until thick; fold into egg whites. Fold in cream and strawberries. Pour into freezing trays lined with aluminum foil or into a 2-quart mold. Freeze without stirring. Turn out of trays; remove foil and cut into blocks. Or, to remove mousse from mold, cover outside of mold for a few seconds with a cloth wrung out of hot water. Makes about 2 quarts.

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Graduate Assistantships, Fellowships, and Nuclear Research Fellowships available for 1959-60 School Year.

Request Information from the Dean, School of Home Economics, Florida State University, Tallahassee.

April 18. Featured speakers will be Mrs. Pauline Park Wilson Knapp of the Merrill-Palmer School, Helen LeBaron of Iowa State College, and President Francis H. Horn of the University.

A new **Child Development Center** dedicated this year replaces the Nursery School formerly located in Watson House, a farmhouse built more than a century ago and acquired when Rhode Island State College was established in 1892. Additional space and special research facilities permit increased student participation and an expanded program in this area. Russell Smart is the department head.

Mildred Barry, formerly nutritionist with the Rhode Island and the North Carolina Departments of Health, joined the home economics faculty of the University of Rhode Island in February as assistant professor of food and nutrition.

Dean Olga P. Brucher, president of the American Home Economics Association, and **Mrs. Elizabeth Crandall,** national president of Omicron Nu, were honored recently at a tea given by the University of Rhode Island College Club and Alpha Mu Chapter of Omicron Nu.

Mrs. Mollie Smart, associate professor of family relations and child development at the University, was chairman of a discussion group at the annual Rhode Island Conference of Social Work in December. Mrs. Smart was a member of the program committee which selected the theme for the conference, "The Human Factor in the Missile Age." The keynote speaker was Andrew W. L. Brown, assistant director of community services, International Union, United Auto Workers, Detroit, Michigan.

TENNESSEE. The fiftieth anniversary of the founding of the American Home Economics Association was celebrated by the home economics department of **David Lipscomb College** in Nashville at a tea on December 5. A three-tiered cake, topped by the numerals 50, was the center of attraction on the tea table.

All home economics personnel in Nashville and Davidson County were invited as well as the home economics faculty and college club officers at the University of Tennessee, Tennessee Technological Institute, Austin Peay State College, and Middle Tennessee State College. Margaret Carter, head of the home economics department at David Lipscomb College, and Lucy Dye, supervisor of home economics in the Nashville city schools, assisted by various other home economists and student club members, received the 165 guests, who included Mary Rich and Vera King, early leaders in home economics; retired Nashville teachers of home economics; and Mamie Newman, who is retired from the Peabody College staff.

Guests were shown through the Home Management Home, a gift to the College by Mr. and Mrs. A. M. Burton. The furnishings of the house were also gifts of friends of the school. Eight girls live there each quarter.

UTAH. "The Modern Family in the Modern World" was the convention theme of the **Utah Young Homemakers Association,** which met in February at the New House Hotel, Salt Lake City, at the same time their husbands, the Utah Young Farmers, were holding their convention. Winifred Hazen of the State Department of Education is the Young Homemakers state adviser.

"Family Life Education Needs at Various Stages of the Family" was the subject discussed at an informal symposium during the fall meeting of the **Utah Council on Family Relations** at Brigham Young University in Provo. Mrs. Virginia Poulson, chairman of home economics education at the University, was in charge of the symposium.

The **Utah Dairy Council** was host to Utah home economists and Dairy Council members and their wives at the Hotel Utah Roof Garden early in December. "Sheer Magic—Festive Parlor Picnics" was the theme of the morning. Centering each table were small *hibachis* filled with glowing coals over which guests prepared appetizers, miniature cheese hot dogs, hot mincemeat for ice cream, and cheese dip. Genevieve Allen, home economics director, was in charge of the affair.

WISCONSIN. The additional home management house at **Stout State College** was formally opened on December 10 with an all-college Open House reception. In keeping with the locale, the new house has furnishings of modern Swedish design.

Mrs. Betty Snyder Cotter, recently of the Baroness Erangler Hospital in Chattanooga, Tennessee, joined the Stout State College faculty at the beginning of the second semester as a member of the expanded institution management department.

APPLICATION FOR HOTEL ACCOMMODATIONS

50th ANNUAL MEETING

AMERICAN HOME ECONOMICS ASSOCIATION

MILWAUKEE, WISCONSIN

June 23–26, 1959

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(List of Available Hotels on Back of this Page)

1. Reservation requests must be sent to the AHEA HOUSING BUREAU, Miss Betty B. Wright, Room 517, Milwaukee Association of Commerce, 611 N. Broadway, Milwaukee 2, Wis.
2. Please make all changes and cancellations through the HOUSING BUREAU.
3. Room assignments will be made in order received.
4. **Single rooms are very limited.** Your chances of securing accommodations at the hotel of your choice will be much better if your request calls for rooms to be occupied by two or more persons.
5. Be sure to list definite arrival and departure date and time.
6. Be sure to list all names of occupants of rooms.

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Milwaukee 2, Wis.

Please check if you are attending a pre-convention session ☐
Specify name of group
(HEIB or EXTENSION)_____

Please reserve hotel accommodations as follows:

1. **Preferred Hotels:**
   First Choice_____ Fourth Choice_____
   Second Choice_____ Fifth Choice_____
   Third Choice_____ Sixth Choice_____
2. **Please specify the number and types of rooms desired:**
   _____Single room(s) with bath for_____person(s). Rate $_____ to $_____per room.
   _____Twin bedroom(s) with bath for_____person(s). Rate $_____ to $_____per room.
   _____Double bedroom(s)_____persons. Rate $_____ to $_____per room.
   _____Parlor bedroom suite_____person(s). Rate $_____
3. **Date of Arrival**_____Hour_____A.M. or_____P.M.
   (Reservations will be held **only** until 6:00 p.m. unless the hotel is notified otherwise.) (If, after making reservations, you find it impossible to attend please notify the AHEA Housing Bureau promptly.)
4. **Date of Departure**_____Hour_____A.M. or_____P.M.
5. **If accommodations are to be used by more than one person please list names below:**

NAME	STREET ADDRESS	CITY	STATE

6. **BE SURE TO SIGN YOUR NAME** ➡ **Signed:**_____

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(Company)

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Hotel Room Rates Per Day

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9	Ambassador	5.50- 9.00	8.00-10.00	8.00-10.00
24	Antlers	3.50- 6.00	6.00 & up	12.00 & up
1	Astor	6.50-10.00	9.00-10.50	10.00-15.00
15	Belmont	4.50- 5.50	6.00- 8.00	7.00-10.00
3	Carlton	3.00	5.00- 7.00	6.00- 7.00
19	Cudahy Tower	8.50-11.50	11.50-14.00	11.50-15.00
26	East-Way	4.00- 5.00	6.00- 7.00	
27	Globe	4.00 & up	5.75 & up	6.00
6	Jackson	4.00 & up	5.00 & up	7.00
2	Kaiser-Knickerbocker	6.50-10.00	9.00-12.50	10.50-15.00
23	Kilbourn	4.25- 5.00	6.00- 7.00	7.00- 7.50
14	Knights Tower	4.50- 5.50	5.50- 8.50	6.50- 8.50
13	La Salle	4.50- 6.00	6.00- 8.00	8.00-10.00
22	Maryland	4.00- 4.50	5.50- 6.50	7.00

Suites: Pfister—3 rooms, $40-50; 2 rooms, $30-40.
Plankinton—3 rooms, $35-40.
[illegible]

Hotel Room Rates Per Day

Key No.		Single	Double	Twin
8	Medford	$ 5.00- 5.75	$ 7.00- 7.75	$ 9.50-11.50
5	Milwaukee Inn (new hotel)			8.00-12.00
18	Pfister	6.00-11.00	8.50-12.00	9.00-16.00
25	Plankinton	6.50-11.00	9.50-13.00	11.00-19.00
4	Plaza	5.50- 7.50	7.50- 9.50	8.50-11.00
21	Randolph	5.00- 7.00	7.00- 9.00	9.00-12.00
20	Schroeder	6.50-12.00	10.00-16.00	12.00-16.00
11	Schroeder Hall* Marquette Univ.	5.00		6.00
28	Shorecrest	5.00-10.00	7.00-10.00	7.00-15.00
10	Stratford	5.00- 8.00	8.00-10.00	9.00-14.00
16	Towne	4.25- 6.50	6.00-10.00	11.00-12.00
7	Westgate	5.00- 6.00	6.50- 8.00	9.00-10.00
17	Wisconsin	4.50- 8.00	7.50-10.00	11.00-12.00

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	Double	Twin
(approximately 10 minutes from auditorium by public transportation)		
Motel Continental 3001 West Wisconsin Ave.	$ 10	$ 9-12
* * * *		
(approximately 15-20 minutes from auditorium by car)		
The Crest Junction Hwy. 41 and Hwy. 100	10	9-12
Krueger's 4300 S. 27th St. (Hwy. 41)	10	
Polly Valley 12700 W. Blue Mound Rd., Elm Grove (Hwys. 16, 18, 30 ½ mile west of Hwy. 100)	8-10	8-10
Sleepy Hollow 12600 W. Blue Mound Rd., Elm Grove	8-10	8-10

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Sucaryl is wonderful for tea or coffee, too, since it gives all sugar's sweetness, and leaves no bitter after-taste.

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Would you ever dream that you can stay waistline trim while you enjoy desserts as flavor-rich as Chocolate Chiffon Pie? The happy answer to keeping your best weight and still eating your best-loved dishes is Sucaryl—the non-caloric sweetener that saves all sugar's calories. Just 117 calories in each serving of this luscious pie when made with Sucaryl, compared to 214 calories if you used sugar. And you can't taste the difference!

WEIGHT WATCHERS' CHOCOLATE CHIFFON PIE

½ tsp. oil
½ c. shredded coconut
⅓ c. cold water
1 tbsp. gelatin
2 tbsp. Sucaryl solution
¼ tsp. salt
⅛ tsp. cream of tartar
1 tsp. vanilla
1 square (1 oz.) unsweetened chocolate
¼ cup boiling water
½ cup nonfat dry milk solids
2 egg yolks
½ cup ice water

Brush 8" pie plate with oil; coat sides and bottom with coconut. Set aside. To cold water, add gelatin, Sucaryl, salt, vanilla; set aside. Melt chocolate in double boiler; add boiling water; cook and stir until smooth; remove from heat. Add unbeaten egg yolks; stir until blended. Add gelatin mixture; stir until smooth. In chilled bowl, beat milk solids with ice water and cream of tartar on high speed until stiff peaks form. Add chocolate mixture slowly while beating on low speed. Pour into pie plate. Chill until set. Serves 6.

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